NALGO drops petition against London Bill

The National and Local Govern-ment Officers Association agreed this week to drup its perition against Landon University's private Bill in exchange for the university's accep-rate flat it should consult trade

The terms of the offer, made this week by the university in both NALGO and the Association of University Teachers, were that the Bill should include provision for recognized trade unions to be consolted on the changing of the university's statutes if the unions agreed to the patient.

A NALGO spokesman soid the minn was very pleased about the offer. However, Mr. John Akker, doping secretory of the AUT, said the ossociation had not yet decided

"We welcome the university's recognition that consultation with us should be trritten into the Ilill. there are other points, such as teacher representation an senate and community involvement, which we feel very strongly about, whether we press for them in Parliament nr

the university's concession is thought to have been made in view

over the ofter, MPs will continue to table blocking motions to ensurethat the Bill does not have on unapposed second reading. The university is hoping that if its offer

better representation of tenchers on senute; representation of the THC and CHI on the university; less brough the Pricy Council."

Trade union consultation was a colleges.

A levels were part of a wider, outmodel education system that started of the oge of 11 to produce "university fodder" and research

need not produce ony great prob-lems. Although undergraduates

Radcliffe College

Martin is new v-c

names warden

Science applicants 'will know less about their subject'

scientlsts.

and while to cape.

University and polytechnic science depurments will have to accept applicants knowing for less science than in the past, a conference on the future pattern of science editering heard at Sheffleid Pulytechnic this week

this treek.

Dr John Spice, staff inspector for science of the luner London Education Authority and choirman of the Schools Conneil Science Committee, tion Authority end choirman of the Schools Conneil Science Committee, said plans to replace A levels and bromber the sixth-form curriculum might make four-year science degree curries necessary.

There were fundamental educational organisms in favour of the Schools Conneil's proposals to reschools Conneil's proposals to respect these A levels by five cub.

might make four-year science de-gree currses necessary.

There were fundamental educa-tional arguments in fuvour of the Schools Camicil's prapasals to re-place three A levels by five sub-jects taken to a lower level in the sixth form, he said. There mould be ediff objections from those with vested interests in the status qua-hut schools had to decide otherher to edicate collidren or be dictated to by the universities.

Under those proposals sixth

to by the universities.

Under those proposals sixth formers could take three N (normalisters)s, each equivalent to holf an A level, and two F (further) level subjects equivalent to three quarters of an A level. But Dr Spice favoured dropping tha F lovel altogether in forour of fivo N levels, full-time study.—TES

Sir Monty for Surrey post

continued from junge 1 he should leave, the decloion still had the go before the sonota, and the student had the right of oppeal

of the support reised by the unions among Mt's. Between 40 and 45 MPs have declared their support for ell or some aspects of the pedition.

While the AUT is still undecided

university is hoping that if its affer and Higher Education, said this is occepted, passage through the Hause will be onimpeded and that the Hill will go to enamittee stage morphosed.

innopposed.

If passed, the Bill will enable the university to change its statutes, subject to important safeguords which jeet to important safeguords which in all subjects and a shortage of books in all subjects and a shortage of liberators. ensure consultation, and subject to approval by the Privy Council, NALGO, which has 2,300 members in the university, will may have to

throp its demands for union consul-infine an senute and court, and for less power to be given to convocu-

Poly staff angered by £20,000 New emphasic purchase of gastronomy books on part-timers

Staff at Oxford Polytechnic are conon a collection of gastronomy hooks. The governors voted by 16 rotes to 12 to buy the collection which belongs to Mr John Fuller, the retiring head of the catering dep-

polytechnic's branch of the National Assuration of Teachers in Further

surplus in the staff salaries fund-believed to be accound £20,000-mny

logy the cost of the collection was moderate.

Unlike the oquipment, the enlection would not become obsolete and would be of importance to Next year the polytechnic would

luve about 40 students studying gastronomy. Catering was develop-ing os a subject at Higher National

Dr Lluyd said that the gavernars

Dr Ifnen has written in the tocal authority asking whether the governors have the priver to spend the money if it means the transfer of femils from a budget other than stimulus in thuse working in this field." purchase of the books. This is a unique collection which is ceu-tral to one of our expanding de-



Exomples of silversmithing from 16 different polyiecturies and colleges went on show at the Design Centre in London lust week. The work, from about 30 students, consists of prize-relating entries to the fourth Johnson Molthey Meluis Silver Awards connection, which is open to all polyiechnics and colleges teaching silversmithing as a full-flore degree or diploum subject.

Mr Tmy Sandbach, Dean of Science at Walverhampton Polytechnic, told the conference that over the past 10 years indyechnics had shown themselves far more flexible than universities over entry requirements for science courses. They also offered for more broad science courses. Mrs Williams urges quality not quantity in teacher debate

The debate about teacher education has to switch its focus from quantity to quality Mrs Williams, the Secrotary for Education, told the Council of Local Education Authorities annual conference ot Sussex University on Wednesday.

Until recently the key question was to expand the numbers of teachers, but circumstances had changed rapidly and the probleme of the 1980s were going to be very different from those of the 1960s and 1970s, she sold. The debate about teacher education

Sir Monty Finniston hos been spininted o pro-chancellar uf Surrey University for direct years from this being established monty for postgrodune etudeuts of successi Lord House of the Base ward of Rudellife College of the 1980s were going to be very first information not work would build the about the standard of the 1980s were going to be very fresh information not under the standard of the 1980s were going to be very scondary schools stiffing to got of the 1980s were going to be very fresh information not the shorting out the 1980s were going to be very fresh information not clearly subjects. The DES is to survey secondary schools information not the 1980s were going to be very fresh information not the shorting out the 1980s were going to be very subjects. The DES would build the data into o mothematical model of demand for accordant teaching in schools, taking Manchells and 1970s, she sold.

Mrs. Milliams save notes of the 1980s were going to be very subjects. The DES would build the data into o mothematical model of demand for accordant teaching in science teaching in the string of the Milliams save, notes of Description and Science in the Milliams save, notes of Description and Science in the string of the Milliams and the provide of Description and Science in the sold of the Milliams and the provide of Description and Science in the string of the Milliams and the provide of Description and Science in the string of the Milliams and the provide of Description and Science in the string of the string of the Milliams and the provide of Description and Science in the string of the st

continued from page 1

whose destinations were known public service was 5,219 in 1975 went so to do roseorch or further and unly 4,079 last year, a full of academic study, on almost identical proportion to 1975.

he should leave, the decloion still had the growth of the student; had the growth of the student; had the right in opposite the committee.

Students had began it show grost interest is the committee about six nonths ago, he said. This relation in a request hy tho students in a request hy tho student in a request hy tho students in the committee. Chernellor of Nawcaste University in a request hy tho students in the committee. Chernellor of Nawcaste University in the request hy tho students in the committee. Chernellor of Nawcaste University in the request hy tho students in the committee of the student in the request hy tho students in the request hy th

forecast

A shift of emphasis lowerds per time degree courses and brent teacher training is envisaged of the next few years by Mr Oil. Minister of State oversoing Mar-education.

education.

He told the British Science Education conference at Mandate Polytechnic this week in the time students are regarded a furnity and port-timers as the regarded to the time of the polytechnic courses with the polytechnic courses with the polytechnic courses. Part-time courses were more

ing os a schject at Higher National Diphama and degree level.

The collection has 6,000 volumes collected over the past 40 years on subjects such as food, restaurants ond hotels. Dr Lloyd helieves it would attract scholars from all over the world.

Dr Lloyd said that the governors.

The reference course were market venicut ond more economical is students seemed in the same time. They was in botter for employers being the students with pacific courses could be speaked period of time.

There hall been a telen upromute full-time course a s expense of part-line park been of the economic factor-meson ing system in colleges wis he nu the number of fall-the side mu the number of fall-line sole;
—und partly because the Irania,
und Business Education Conic
were increasingly demanding Abd,
qualifications for their conwhich excluded "the son of per
who was the core of the itschand just after the our".

Asked whether he would establer giving part-time subs mandatory prints, Mr Oske z the department was successful whole question of discrete, fees in local authorities and pected to know the results by end of the month.

NEXT WEEK

Almyick College's alleron Tory Party's task force on early

Higher Education SUPPLEMENT

THE TIMES

£2m start for British **Brookings**

July 22, 1977. No. 300

by Darid Walker The Social Science Research Count-

The Social Science Research Council is to make its higgest ever invostment in a single project by committing 12m to endow a new institute for policy studies.

However its plan for a "British linashings" depends on private sources—probably foundations such as Ford, leveranduc stud Rowntree—finding an additional 12m in andergrite it. The institute will be a may creaded, nor based in the a new creadon, my based on on existing university department specializing in policy studies are an idependeut centre.

la a statement this week, the SSRC envisaged on institution with ahon 40 researchers in past by 1980, "Their work will strengthen he bridge between policy unit analy

the bridge between policy and analysis rad between theory and practice is public decision-on-king.

"The institute will be converted with resparch into sortid prairies like housing and education, the technological and environmental appears of transport, the interaction of social and economic policies, government structures and systems and

Tories' first "task force' affective control in universities, and the ways of State for irride to the Ugic Committee. All to the UgC were and committee and the powers of the Commons to the Ugic and the UgC were and the powers of the GMC, which controlled the co made union representastructure of musingentent and in universities, and the ways in universities, and the ways in association was olso asking secretary of State for trade representation on the Unitaries, to the UGC were by ber and there was no be among than.

fludent hardship tion and industry The future of studeoi house ants awarded Audio-visual aids for meetings awarded

Green Paper favours teacher entrants with job experience by Judith Judit Colleges should give preference to those with experience outside education in admitting people to teacher training courses, the Govcroment says in its Green Paper, Iducation in Schools, published this week. To improve and develop teaching skills, the paper makes dure promid in the place with teacher and interested organizations on how the gap might best be lifted. The paper supports more extenleges so that each will have a henter in the first year or work and looks forward to the sprend of induction schemes.

croment says in its Green Paper, Education in Schools, published this week.

The paper, which contains few surprises, says that naive attention should be given in initial teachers should be given in initial teachers should be given in initial teachers and parameters to the national importance of comperce and industry, As expected, it favours minimum qualifications of two A levels and the level fired C or CSE Grafte I in English and markenmates for entrains, allowing for some rational many and markenmate students on deducing an all-gradiante profession is repeated but loar-year conves for all are ruled and for finantial feight and the diploma of higher education and the diploma of higher education as a route into teachers with particular subject.

The forecast the content of teaching is repeated but loar-year conves for entrans, allowing an analysis of the diploma of higher education and the diploma of higher educatio

Universities face pay trouble

Pay increases for lecturers shave a minimum five per cent will force universities to cut spending on looks, equipment and the maintenance of hulbings, the Committee of Vice-Chancellors and Principals has warred.

pais ans warned.
In response in the Chancellar's statement last Friday, the CVCP said that every one ner cent rise in soluties whove five per cent would east universities £3.5m, which would have to be found from other paris

of their intul grant.

The Association of University Teachers, Imwever, has indicated that it will press for increases of 20 porcess or more, to keep up with the cost of living and to rectify its "historical" anomaly dating from 1975

The recurrent grant for 1977-8 of £600m has been enculated on the basis of a tire per cent increase to academic solarlus. The CVCP has calculated that universities would be £15m short if salaries increesed by

The AUT line asked for a meeting with officials from the Donarment of Education and Science togother with representatives of the University Authorities Panel, which represents universities in salary negotiations to discuss salary claims in the light of Mr.

"Hut Crutckshank, if you can't tell us how we can squeeze a 25 per cent my rise out of present limits, noone con'"

GMC to have new role in training

HEAD

ADVANCED

MATHS

General Medical Chuncell should be reputable for coordinating of the proposals for gradume ching on the University for the proposals for possible gradume proposals would be among them.

General Medical Chuncell should be reputable for coordinating of the proposals for gradume ching stages in neutrinol education.

Announcing this in the Commons that by ber and there was no be among them. The proposals for gradume ching on Morday, the Secretary of Stote for Social Services, Mr Emuls, said they would be taking of n Bill to huplement the dinning of n Bill to huplement the first stages of interested parties.

As the next step the Garery proposal would depend on the progress of discussions with interested parties.

"As the next step the Garery proposals would ment intends to work out provisiousl propusals for possible legislation, work out provisiousl ment them?"

As the next step the Garery proposals for possible legislation, with proposals and the bulk will go to find the committee led by Str. Alec Merrison, vice-choselfor of Bristol postgraduate advantage in the proposals of the pro

Contents

British Association



this year's president of the British Association for the Advancement of Science. Professor Sir Andrew Huxley, grandson of

Special quarterly report on BA's work, I-VIII

Student housing

Increasing the numbers of home-based students will not solve their housing problems, 7 Lender, 12

Living languages

Nigel Reeves discusses how modern language teaching could be made more appropriate for industry and commerce, 13

Semantic problems

Jonathan Culler reviews the first volume of John Lyons's new introduction to semantics, 14

Doing the pool

John Pratt discusses the consequences of abolishing the local authority pooling

Engineering

Frances Gibb looks at the

The Immediate reaction of Professor John Waltun, doan of Newconstle modical school and chairmoo of the GMC education committee, was: "I'm delighted and I hope they get on with it".

Mr Ennels told the Commons that if parliamentary time could be found before comprehensive legislation was ready a shorter Bill would be introduced to reconstitute the GMC clong the Merrison lines with a majority of elected members, as

DON B. Mary .			5
Noticeboard			8
Overseas news	:	-	10
North American	neivs		11
Letters	•		12
Books			14-17
Classified index	-		. 18



Within three years, Hirmingham University library will be '411 per cent full, Dr M. A. Pegg, the librar-

In a paper presented at a recent meeting of the nuiversity council, he says that the University Grants Committee accepts that for all practicid purposes, a, library with shelves 85 per cent full is "effici-

ereas, sholves would be over 90 per cent full within two to three years. The first subjects likely to be effected were science and engineering history, languages and literature and special culterthos, followed by law and music. The medical library was the only one with an immediate

space problem.

Birmingham spends a relatively his proportion of its budget on the library compared with other universities, he says. In 1973-74, the latest figure available, it spent 3.2 per cent campured with an average of 4.5 per cent in other British universities.

deal for

girls sought

purchases, rose even naire because to be as effective at one tenth of the devaluation of the pound. The cost,

tion services, according to Mr Gerry Smith, librarian of the City University Business School. Ife told o conference an the

" Puture of Information Services" versities.
Since 1973, it had had on new perindicals. Costs of running at the same level, however, had risen by

almost 100 per cent, he estimated.

To 1975-76, they had risen by 3.1 per cent over the year; in 1976-77 per cent over the year; in 1976-78 which had been required to set them up should now he directed to ensuring that services were cost-effective.

Dr Pegg says it is difficult to show the effects of devaluation and inflation on look arises because

show the effects of devaluation and inflation on book prices, because purchasing had had to be adjusted to the available funds. But the knest bider to University Costs showed an overall increase in costs (hooks, binding, periodicals) of 2.1 per cent fat university libraries for an induction course for indergrationagement research unit shaved the price of British academic books to hove risen by just over 21 per cent from 1974-75, while non British books, which at Biraningham

books, which at Birmingham mirs toware of new publications accommed for over 70 per real of often cost about 180 a head a year

◆ About Lim a year is being ◆ Sussex University has agreed pro-wasted through the mefficient pasals far reciprocal rights for design of ecademic library informa-registered readers of both the pussex conversity has agreed pro-pusals far reciperacal rights for registered readers of both the university and Brighton Polytechnie. The rights would be for a trial period of at least a year, starting in September.

A detailed assessment of how auch the arrangement had been used, and the costs involved, would be made at the end of the year.

Library cuts conference, page

ciliation of the rations interests in-vilved. You have to reconcile user interest with that of the publisher and author without whose prior work and investment the material to

butter!."

The council opposes the examplestion that the IBC should the right to run local radio ser. In view of the significant time of the significant time of the radio derived its minutes of the radio derived its minutes of the radio derived its minutes of the radio derived its minutes.

Multiple copying rights proposed for colleges

Colleges and schools should have the right to make multiple copies decture round and conceptrate of articles and parts of books, a

Mr Charles Clark, managing direcor of the Untchinson publishing group and an active member of the Publishers' Association tesm reviewng copyright, described "resource. entres" hased on rolleges or libraries with the right to photastat u limited unuther of coples without permission. He suggested 500 rupies mul up to 12 in 15 per cent of a

Mr Clark was discussing the recommendations of the Whitford Committee on Copyright and Design which proposed a blanket licensing scheme by giving outhors a lamp sum to enable articles to be copied without each time seeking permission. Mr Clark fayuared in set amount being charged for each set amount being charged for each puge copied. Schools and colleges, however,

schools and colleges, however, through the local education authorities, could pay a block fee. They would then have rights of multiple copying under guidelines to be orgetiated by the authors' and publishers' associations, librarians and local governments. Putting the aflecation of all carriers of the carriers of the selection of

local government.

Mr Clark's theme was the recan-

The conference, the fifth European Library summer seminor, held in Liverpnol, also heard discussion of how best to educate students in the use of their university and college libraries. Professor A. J. Erons, librarian of Longhhornogh University soil the agents of the conference of

conference of librarians and pul-lishers was told last week.

Mr Charles Clark manually disce.

Mr Charles Clark manually disce. the Control for Educations be-the Control for Educational Id-thology has told the flome Office! a reply to the Anna committee report on the Potters of the

The committee's tessors in rejecting the proposal, the through any not enviseing. Especially as the body would be in 60 to dependent on the provision of fourth channel and would specificate the channel and would specificate the channel and would specificate the channel activities when new dated became available."

mic lordy representative of discretive deliberative of the preferable to present structure, the CET believe in the condition of the analysis o

ing resources and teachers so

have far aure influence of the produced and have it is to burned."

The proposed body would in rights of access to display facilities and allocate these pray picket educational programme etc. a would coordinate process materials by broodcests. and cinl producers and desiral institutions. against move

It would have funds which to commission educational sole trons on a limited scale and all also conduct research in the decision of the conduct research in the decision of the Polytechnic this tweek picketed Liringstone House in protest against a decision to carry un 320,000 conversion work on the tiveness of educational brooks

hast week o meeting of 50 stuff Last week a meeting of 5tt stuff vided overwhelmingly to picket throughout the summer. The work is being done to bring the boilding up to the standards of the licability and Sufery m Work Act. Staff are engry at the disruption to tearling the summer of the transport of the disruption to tearling the summer of the transport of the disruption to tearling the summer of the transport of the move of the summer of the summer of the transport of the summer of the transport of the summer of the

News in brief

'Build on existing

links with industry?

NELP staff

the next nine munths. The alterations will mean the temporary move same academic staff will be

Acres Note Species

Lecturers claim that the survival

other at West Ham.

In a statement issued this week, the West Ham branch of the Motional Association of Teochers in Further and Higher Education, said: "Management have failed to pravide suitable accountaridation of an equivalent standard for the mathematics department.

"Until indequate accommodation is provided which is satisfactory in which NATFIE members in the science faculty now at West Ham, is provided which is satisfactory in science faculty now at West Ham, is provided which is satisfactory in the NATFIE members in the science faculty now at West Ham, is provided which is satisfactory in science faculty now at West Ham, is provided which is satisfactory in the modern provided which is satisfactory in science faculty now at West Ham, is provided which is satisfactory in the modern provided which is satisfactory in the new Heulth and Safety cules to curry out the work on Living-stone House, "The need for it is by the Department of Education and Science." There was obviously some inconvenience but it was an exaggeration to say that courses

of two departments and the permanent mave of the authomatics department. The present plan is to split the department between two boildings, one at Marrianil Point and the other at West Hum.

In a statement issued this week, in a statement issued this week, in a statement issued this week, in a statement issued this week.

Disputed election angers Huddersfield poly staff

start at finiteerstield Polytechnic three nigry because the Department of Education and Schnee has allowed Kirklees Council to go ahead with elections for government of garenament

Phe department has ogreed to the elections on a confingency basis, though a spakeswemon salal this week that it would not prejudice the final decision about the instru-

Less week, the polytechnic's nea-demic board considered the coun-cil's request for elections and voted to reelect the existing members of the governors and not to hald elec-tions under the countell's scheme

The Huddersfield branch of the National Association of Teachers in Further and Higher Education, the governing body, the accelentic buard and the students have all condem-ned the councid's propused changes in the instruction of different set

of proposals which would reduce the industrial representation on the governing body out allow lecturers

Staff at Huddersfield Polytechnic staff assembly. Alt Harry Labouers, secretary of

pruposola students would have three

decision had yer been reached obun the instrument of government. The department had received a coll from the local outhority asking whether it cased he'd elections for gaveners had it had egreed to this up a con-tingency busis.

Dahrendorf elected **BA** fellow

Professor Ralf Dohrendorf and four of his professorial colleagues in the London School of Economics have become fellows of the British Academy in an election characterized by the number of London acodemics

The British Acadamy, to judge by the number of economists and social scientists elected, is moving slowly in the direction of glvlng more houseroom to speciolists in madern subjects as presputed by the election subjects, as presaged by the election of Sir Isalah Berlin as president in

Professor Dolirendarl, e sociologist, joins the ranks of fellows along with Professor J. B. Joll, a specialist in international relations and history, Professors A. K. Son and B. S. Yomey, both economists, and Professor J. A. G. Griffith, a

From University College Loudon From University Colloge London new fellows are Professor I. R. Christio, an Instorian, and Professor J. R. Halo, a specialist in Italian history and Innguage. Mr J. N. Coldstreom, professor of Aegean archaeology in London University also becomes a fellow.

elso becomes e fellow.

Oxford University supplies its usual number of distinguished specialists. New fellows are Mr. D. S. P. Brock of the Orientol Institute, Oxford, biblical enecialist, Prefessor C. J. F. Dowsett, Armenian specialist, Professor J. Gottmun, the geographer, Professor Peter Mathias, the economic historian, Mr. P. R. S. Moorey, of the department of antiquities at the Ashmolem Museum, Mr. P. J. Parsons, lecturer in papayrology, Mr. A. M. Quintoo, the philosopher, Professor P. E. L. Russell, the Spanish epecialist, and Mr. G. H. Treitel, reader in English law.

Doncaster urges

the NATETIE branch, said this week: "I would prefer these elec-tions not to take place even in a contingency basis.

contingency basis.

'We are afraid that once the pattern has been established it will be hard in change. I am ustonished that the DES have ugreed to this."

The stuff have written to the Secretary of State and to MPs to procest about the decision to allow stuff and student representatives to be elected for an interim period.

Mr Paul Wobb, president of the students' union at the polytechnic, said students were also opposed to the elections. Under the Kivklees proposals students would have three

representatives on the governing bady compared with four in the alternative proposols.

The DES spokesman said that us

NALGO calls for grading appeals system

still needs £1m



The state of the s

The proportion of science and unfair manner."

The proportion of science and unfair manner. The proportion of science and considers the constant emphasia and the constant emphasia and the constant emphasia and the proportion of science and the proportion of science and the proportion of approved courses and the proportion of approved courses from more and the proportion of approved courses from more than the needs of the district era such that, while preserving the cut of the axpensa of said students must be preserving the cut of the preserving the cut of approved courses and deliver on high cut of approved courses are dealtred to make the preserving the cut of approved courses are desired to the cut of approved courses and of approved courses the numbers of approved courses the number of approved courses from flow to a preserving the cut of approved courses and of approved courses the number of approved courses from flow to a preserving the cut of approved courses and courses the number of approved courses the number of approved courses and outcet of approved courses and courses the number of approved courses the cut of approved courses and courses the number of approved courses and courses the number of approved courses the cut of approved courses the number of approved courses the number of approved

Nervous I.e.a.s ask government for vote of confidence Representatives of local education ized, the Le.o.s were being starred unthorities meeting at Sussex University last week asked the Government for an unequivocal rote of conflicted in the role of local of confliction in the role of local of confliction of confliction in the role of local of confliction of confliction in the role of local of confliction of conflict

Cambridge waives usage exam closure rethink

Combridge University to insist on pass in Use of English os an entrance requirement, loss decided to pass in Use of English os an entrance requirement, loss decided to pass in Use of English os an entrance requirement, loss decided to pass in Use of English os an entrance requirement, loss decided to pass in Use of English os an entrance requirement, loss decided to pass in Use of English os an entrance requirement, loss decided to pass in Use of English os an entrance requirement, loss decided to pass in Use of English os an entrance requirement, loss decided to pass in Use of English os an entrance requirement, loss decided to pass in Use of English os an entrance requirement, loss decided to fine Between the Interest edition, the University of London, offered Use of English and the University of London, offered Use and the Interest edition, the University of London, offered Use and the Interest edition, the University of London, offered Use and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and the University of London, offered Use of English and University of London, offered Use of English of London, offered Use of Englis

hy Frances Gibb

hy Frances Gibb

The Notional and Local Government Officers' Association has asked the TUC to reupen discussions with the Committee of Vice-Chancellors and Principals on setting up a nutional solary grading oppeals system for non-teaching staff.

The NALGO, which represents 44,000 manual workers and 16,000 white-collar staff in universities, claims the universities are failing to honour a commitment to a nuctional appeals system which was made in July 1968 between the CVCP and TUC.

mode in July 1968 between the CVCP and TUC.

It is auxious in establish a national ponel which could hear individual ponel which could hear individual ponel which could hear individual oppeals against grading decisions after local uppeals procedures have been exhausted. Hut the universities are refusing to establish that pact of the 1968 procodural agreement which relates to national appeals, it says.

Mr Alex Thompson, the NALGO's national officer for universities, said: "A woll-established national uppeaks system acts as a vital sufety valve for individuals who fael they have a legitimate griowance over their grading oud who can take the matter no further at local level.

"We are really tulking about establishing sound industrial relations in the universities—as in other areas of the public and private sectors."

A spokesman from the Universities' Committee for Non-Teaching Stuffs, part of the Central Council (representing universities and omilioyers), which was set up to implement the joint CVCP/TUC roport, said this week that universities did not agree the report contained an agreement to set up a national-appeals system.

Music academy



For the stor personality the part

becomes a mere projection of the actur in a given simulian, while the actur in a given simulian, while the character actor sublimates himself until he is almost unrecognizable, so completely has he given himself to the cole.

But however the actar interprets his role it will non become real or alive unless he can communicate something that strikes a shared resonance with his audience. This, of course, is not enough, he must also have techniques, style and be a master of his art.

a master of his art.

The good sociologist must also rely on techniques which, like the actor's, go beyond a struight reproduction of reality. He, too, is a mediator between the object of his study and his public and like the actor ha is trying to show how it could all make sense—not perhaps the sense or rotionality that he would make of the situation, but the sense that other human beings could make of the situation. While acknowledging what is strange in the fauiliar we can yet reach out to recognize that which is fundiar in the strange.

Services will be limited librarians warned

we have, the production of books as part of intellectual life ", he said,

Giving the lecturer's viceopaint Dr Peter Mann, reader in sacialogy, Sheffield University, suggested that part of the student grant should go direct to the fibraries. Basing his

direct to the fibraries. Basing his arguments on Department of Education and Science figures which showed a shortfall in the spending on books of £41.18 per student for 1974-75 he said: "The obvious economic answer is to reduce the student grant bank element by about £50 and give the total sum of, say, shout £17m to the bigher education Illuraries for their book funds."

IIIs own researches showed that

37 per cent of students had never ordered a book for themselves from a university bookseller and 16 per cent did not borrow from the university library at all. "My own sur-

dent survey showed that many scientists and technologists said they just

studies and all sorts of suidents indi-

cated that they did nut occil to only

He felt librarians should be giving primity to the schularly col-lection ruther than use their scarce

resources to buy student texts, par-dentarly in multiple copies. Dr Mann also called for greater effi-ciency in using what limited resources were available. There was

by Sarah Segrae

University libraries may have to centrate on undergraduate needs, a conference on coping with library hudget cuts was told last week. Mr James Thompson, the Read-

Mr James Thompson, the Rending University librarian, told the conference organized by the National Book League at Hollaum Central Library: "This country is now well on the road to becoming a backwater, intellectually and acsdemically stayed of all sorts af research facilities including library materials."

le suid that though libraries had which are going to hart most in the next two or three years are directly related to the screwing down by the Government, for economic and political reasons, of the expansion in higher education."

The Government needed to face up to its commitments to higher collection and universities had to realize that Illuraries were not some kind of aptional extra but a cen-tral academic facility. Libraries would need between a 15 and 30 per cent increase to cuver inflationbry price rises but the indications were that very few would receive us much as 15 per cent.

It means that expensive pur-

It mean that expensive pur-chases, major reprints and reference books were not being hought. With the fall in the value of the pound libraries were looking closely at their foreign purchases. Of the £75,000 Reading speat on books for 1975-76 only a third was on books

from the British market.

A similar aircation existed with periodiculs and Mr Thompson explained that they had cuncelled three German works on chemistry, Bailstein, Gnelin und Landolt Börnstein, which cost them E5,000



Mr Norman Franklin, cholratan of Routledge and Kegan Puul, gava tho publisher's polar af view, emphasizing that the cost of princing liad so increased that they had

more assign tendency to usa microscoping tendency to usa microscoping tendency to that prices and successing their successing the present and the additional buckers of the Ackinson report which recommended that books motificen as separate store for five years before being sent to the British Library Londing Division in Yorkshira for use or disposal. Those seconds survey of university library resources in the University library resources in the University library resources and the consequence of the con

Wardens urged to safeguard overseas student interests

by Mike Duckenfield

A plen to wardens of university talls of residence to safeguard the interests of overseas pastgraduates in Hrhain has been unale by the assistant director of the British Council's overseas students' services

department.
Mr David Jenkluson judd the 79 participants at the thirtieth annual university wardens' conference, head at Exerc University last week, that nverseas postgraduates often faced unusually difficult accommunitation unusually problems. They needed solf-service flots where they would be able to stay during the summer when links of residence were let out for con-

The number of all overseas students had increased from 70,000 to 114,000 during the past 10 years he said. The share going to universi-28 per evm, largely the more increasing number of postgrahmaes.

Another trend had been the mave away from arts subjects which had now been overtaken in pupularity by the sciences, social studies, in-ministration and business studies

and technology.
Overseas students generally were expected to suffer gremer hardship

by the deputy director of International Students' Huuse, Loudon Mr Bill Murray.

He sald: "I am quite sure referred to the hardship funds set up at the universities. We already have an increasing number of 'bad debts' and the list is lengthening

Cuncern was also expressed over the predominance of first-year students in halls of residence, which were in dails in resoluting which were in dailger of heronting first-year ghettoes". Where more than two-thirds of students were newcomers, the halls' community life suffered.

Several wardens suggested trying to attract muru senior students to use half facilities by offering them junior common-room membership and reduced-price meals.

Academics should also be Academics should also be encouraged to take a greater part to half life. The warden of lingh Stewart Hall, Northighem University, Dr. D. Rees, said: "Many wardens are not doing enough to ensure that academic staff pull their weight. The many suff simply want cheap accommodation." want cheap accommodation."

The three-day conference was organized by the Association of Principuls, Wardens and Advisers in University Women Students and in the coming academic year due to the increase in unition fees—more than doubled for postgraduates and the Conference of Principals and Advisers and the Conference of Principals and The

a need for becomes to supply sensible reading lists to both filtraries and bookshops, and there should also be research as to how people, at all levels, used the information. The don't knows' defended

Replying to Dr Mann's criticisms of the student use of libraries Mr Charles Clarke, immediate past president of the NUS, said there was a feeling omong students that the books which were available were not directed in a general sense towards the courses or neadenic occivities affered. He urged pulls work.

octivities affered. He urged publications to give greater cansideration. Nation books for specific courses.

inwards the courses or neadenic occivities aftered. He urged publishers a logive greater cansiderulant in books for specific courses.

Mr Clarke's five-point plan for coping with the cuts included a decision of the control of the course and linear and l

Extra funds for

Indifference microforms Don's diary criticised

by Patricia Santicelli Despite the advantages microlay propies the anvantages microlateristic their use in education, been disappointing, the authorities and a study of internforms say in factorial control of the control of th

introduction.

Mr Bernard Williams, directors Mr Bernard valuans, directors the National Reprographic Ger (or the uncommentation and R Richard Fothergill, of Newschiller Pulytechole, 37 ft neglect is partly due to a kell commercial interest among observed. ammercial interest among ele; In 1973 an Anterican wirey end

specialists, and researchers was if the notemial uses of pire ma-

Microfilms in Education Walter Paper No 13, by Bernard Willis and Richard Fothersill, public by the Council for Educated Technology and the National Rep.

tion is 'fluw on earth can they?'
he suggested. I was spending the
first week of the vacation with the
World Council of Churches in Combridge. A group of scientists and
disologians were trying to redefine
the challenge af modern science to
theology and I was there to represent the devil's advacate wearing his
catalogical but lished that education formed of one share of a 21 per cent was form market in Britain Andesciological lut.

It is often the case at such gatherlogs that the saclal scientist is
greeted with a suspicion which falls
somewhere between disbelief that renson was deeply ingrated at-ing hobits amongst adults.

"Education is perhaps to the spectar with a clientele fig gal-timus prefers to learn beautiful. somewhere netwern dispersion of the sociology could say anything a sen-sible person did not already know and belief that anything it does say would, in the eyes of a sonsible per-son, he obfuscating rubbish. On this occasion, however, my spector with a clientele big retimes prefers to learn through
increase material rather than the
its traditional printed printed
its the schools he is
published next week.
Their paper is lower a
increduction for texts at
lecturers, administrates were
specialists, and resentes were

On this occasioo, however, my fellow participants were informed and or generous enough to admit that sociologists could have a role to play in collecting facts about people, finding correlations between different types of social behaviour and even describing the constraints

How can thev?

It was a Catholic priest who put his fager an it. "You mean the question is 'Huw on earth can they?"

and even describing the constraints
and punchialities af social institutions and structures.

All this they were prepared to
gram—then social science like
against science and, in its new way,
theology was in the business of revesting truth in the sense of offerlag describitions about even by ing descriptions about some kind of reality—but could it, like real sci-eace or like theology, offer any kind of explonation?
Did I think my work really ex-

Chilean students
The World University Serich been awarded 1210,000 is explained anything about the human condition or was it just as accurate a description as possible, sea, Development to intract thilean refugee programmed coming nearlemic year, to announced this week.

Its grant fur the programmed which stands at \$1.5m a get to be increased in \$1.7m. Since the Chilean refugee are the past few years which contained not only long descriptive accounts of the people I was studying him also autorous notes to myself in red lak and which nearly always stated with "why...?", "pussible because..." or "this might be taken up from Octoor, and the taken up from Octoor, will be taken up from Octoor, will be taken up from Octoor, and the content of the conte

myself admitting I had gone into the theatre for five years and would possibly still have been acting had my career aat been interrupted by the arrival of children. Well, what of our was doing now?

a purely tantological sense) in the date of the respective of their senses. The creationists do not dispote with what I was doing now?

At drame school, inspired by the writings of Stanislavski, I but carefully kept a dark in which I creation to chart my journey of discovery into white the continuous intimate childhood memories but he working and twenty of the continuous intimate childhood memories white in the way thu scrip take the work in fact in made sense for her act in the way thu scrip take to have the work in fact in made sense for her act in the way thu scrip take to have the work in fact in made sense for her act in the way thu scrip take to have the work in fact in made sense for her act in the way thu scrip take to have the work in fact in made sense for her act in the way thu scrip take to make sense of it in terms of a pass. I was uninterested in compiling a log for the development of pretty ingenues but gloried in the childhood memories at the politic threat the sense of it in terms of pretty ingenues but gloried in the childhood and the sense of it in terms of whether sense is the problem in terms of whether sense is the problem in terms of which are all which is the politic think I can understand why same interested by the strangeness of pretty ingenues to the research only the working of its grant that its not the continuous, Universal thread the sense of it in terms of whether sense the entered all arises to the research only the continuous of the continuous, Universal thread the sense of its of the interest of the continuous, Universal thread the sense of the entered all arises to the research only the continuous of the continuous, Universal thread thread

theatrical illaries to the research ones it was possible to see the continuity. Undeterested in providing descriptive accounts of the educational system, the working class family or clutch attendance, I now find myself fascinated by the chollenge of trying to understand why people believe and do things which seem on the face of it quite incomprehensible to the rest of us.

If, for example, one comes ocross

there really were such people (they particular man, and yet others of the characteristics will differ from would have been less introductors in Morth American. When I assured them creationists circuitists certainty existed in growing numbers, they insisted that either the creationists were not proper scientists in their man, and yet others of what they believe to be the rational workings of their conscience is not proper scientists neither the creationists were not proper scientists in their man, and yet others of the characteristics will differ from this own but he is fixely to find the workings of their conscience is not proper scientists in their conscience in the characteristics will differ from this own but he is fixely to find the big own but he is fixely to find the some basic ingredients if he looks term of the characteristics will differ from this own but he is fixely to find the books term of the characteristics will differ from this own but he is fixely to find the some basic ingredients if he looks term of the characteristics will differ from the own but he is fixely to find the source basic ingredients if he looks term of the characteristics will differ from the own but he is fixely to find the source basic ingredients if he looks term of the characteristics will differ from the own but he is fixely to find the source basic ingredients if he looks term of the characteristics will differ from the characteristics will differ from the own but he is fixely to find the source basic ingredients if he looks term of the characteristics will differ from the characteristics will differ from the own but he is fixely to find the source basic ingredients if he looks term of the characteristics will differ from the ch would have been less intredulous in North American. When I assured

they think they are right."

To define ane's problem in terms of understanding why same, intelligent people can believe things that other same, latelligent people cannot, rather than in terms of whether or not what they believe is true, leaves one much to the accusation of reducing all knowledge to a wishy washy relativism. But this is an unfair occusation. It is not beyond man's capacity to believe something

insisted that either the creationists were not proper scientists on the must be crazy.

I tried to explain that they were proper scientists—or at least quite as proper as the majority of scientists who believed in evolution—and that they were certainly not forcest in the string and the string and the sociologist too finely. There are obvious differences in both their objects of study and the limits of the string continuum of interplay he they were certainly not forcest in the string and the sociologist of finely. There are obvious differences in both their objects of study and the limits of the sociologist of the sociologist of the part (data), warfer and they were the extremes up an actor disconnected the part of the sociologist of the sociologist of the sociologist of the sociologist of the part (data). who believed in evolution—and that they were certainly not (except in a purely tantological sense) in the slightest bit bereft of their senses, are important differences but they man the control of their senses.



recognize that which is funding in the strange.

I had not been successful in communicating to the Anglican chemist my belief in the safity of crentioulsts. The following evening I was slightly more successful when u theological asked "Aren't your Moonlies?"

On the wheel the form On the whole the familiar is far less frightening than the unknown and one of the things that stands out most clearly when I look chrough the notes in my research diaries is how ordinary and saue have become those idens and netions which ance seemed bizurre and threatening. I now feel far less apprehension about staying with members of the Unification Church then I do when some unknown relatives of my lushond's turn upon their holinays from Canada.

I'erhaps this means I have become

l'erhaps this means I have become brainwasheil or that my neuse of outrage has become ilulted. I do not think so. I can still luok through the dlarles ond recall what I saw and what I thought as I recorded my impressions ofter each session. I hold fairly strong opinions about what is right out what is whong and certainly believe that psychotle and brainwashed individuals du exist, but all the ovidence from hoth my theatrical end my cesenrch diarlus suggest to me that whenevar I feel amazed at the beliefs of men it with not be on entirely worthless exercise to ask the question "How on earth can they?" Perhaps this means I have become

Eileen Barker

The mahor is a lecturer in socioluguat the London School of Economics.

Beware rightist agitators—Fowler

Markism, and during the instance of the stance of Lundon the marky and the pubs and streets of the strength of the communist thing.

"Reading University Library is inst no lunger in the longue of much libraries which can afford that amount naturally an iterate which can force that a soluble to publish a back the soluble was given by a solub for higher olicetion. The bookstapts were being cancelled in scriptions were being cancelled in the search for ecommence—Holl University cut phase for its problems being the sarcts for ecommence—Holl University cut phase for its problems being cancelled in the search for ecommence—Holl University cut phase for its problems being cancelled in the further that costs with the present education is the soluble with the problems in the cost of principle with the cost of principle with the cost of principle with the plants of the university to consider whether it was forced that the plants of the university of the university to consider whether it was forced thread the plants of the university to consider the students of the university to the university to a student form of the university to the universi

was the phrase Ralpin the season with the phrase of the phrase Ralpin the season was also an arxisis and plant the describe the season was also as a season was a

which, said a member at the raviow

which, said a member at the raviow plenary, almed to create a now type of political intelloctual vocy much a Gramscina ideo, CUL is definitely not a workers' university. About 60 per cent are or have been students, and another 20 per cent are in some area of academic work. Some complained that activists outside the academic sphere were not adequately renresphere were not accountely repre-sented, and others that the lenguage used in courses, even in an "lutro-duction to Morxism", went over



Student housing at Munchester-known as "the Toblerone black",

the stay-at-home syndrome

David Walker on the Kent report

og surplus are allocating flats and

ent—ta "drive through For polley on student

itles. At the end of last

g this means, given that no dis likely to be speed on addi-

He should, however, he full of admiroilan far bis colleague's drive, for he is simply expanding the boundaries of his knowledge by uvailing himself at information proby two very respectable ser-offsprings of the Centre for

University.

Dial a Medical Education Service (Danies) and the Medical Audio-Visual Aids Service (Mnvia) bath began aperating last year to providu

directed at busy doctors wishing to further their education and keep abreast of current medical knowledge and trends.
The service consists of a short

The service consists at a short hally prerecorded message, which can be gat by dialling n telephone number. The message highlights some impartent and tapical issues in medical practice, such as recent advances in diagnosis, the side-effects of drugs, patential sources of averaging meeting and prescribing af errar in practice, and prescribing

iobits.
So far 60 messages have been recorded, and 15 more are in pre-paration. Tapics range from Lassa fever to hay fever, epilepsy in driving, breast feeding, diabetes in childhoul, the immunication of small children, the treatment of adder bites, and protection against

the party of the project, and has been coardinates the project, and has been coardinates the project, and has been contributions from has pitolo in London, Gleavaw and Edinburgh.

"We haven't really been pushing it and it has been n bit alow in getting aff the graund", he sold.

"It is something difficult to get volunteers, as the service is ananyours and they doo't get o fee. Wo are now seriously considering payment to encourage contributors." The servica was uriginally

to spend money on a long-distance telephone call.

One discovery is that doctors do not coll hetween surgerles. They tend to telephone between 9 jun mid 11 jun, and this correlates with

tlan of contacting Mavis.

Mavis, born one month after Dames, is the first phose of a larger project, "Learning on Request", which has been sponsared by the Wellcome Foundations and Undate Publications Ltd. The second phase is due to be launched in September.

Castle college's overseas attraction

helps it to go down fighting

calleagues.

"If we can get to these people with a three-minute message, in tickles their conscience and they want to learn more", Pr Gleson said. "But I don't see why It should not be available to anyone who has the time to space."

Calls have in fact been received from the south of England, and Dr Gleson hopes that in lature it will be passible to set up message in machines. In lacal pastguduate the centres. This would extend the service to doctors who might not want wice to doctors who might not want with the control of the doctors who might not want with the control of the doctors who might not want with the control of the doctors who might not want with the control of the doctors who might not want with the control of the doctors who might not want with the control of the doctors who might not want with the control of the doctors who might not want with the control of the doctors who might not want with the control of the doctors who might not want with the control of the doctors who might not want with the control of th

proximately sou sinject neadings. This makes it passible ta retrieve the American experience.

In America, the system is far more sophisticated", Dr. Gleeson painted aut. "Doctors are sent a menu af items, and cao request the particular messoge they want. Our operation could be best described us heling a la carre."

He added that in Canala there was not even better example of the interphone in medical enhacation: "If a ductur runs into trouble with, let us suy, a drug pollent, ha can get in touch with an expert by dolling o number."

The United Kingdom has not yet reached that level of sophisticutian, but for those requiring more detailed information it is just a question.

The interphone in the superior of the collection of the particular more of the collection of the particular more of the particular messoge they want. Our of the collephone in medical direction, its format and duration, and where the actual film of the particular messoge they want. Our of the collephone in medical collection, its format and duration, and where the actual film of the particular messoge they want. Our of the collephone in medical collection to the the particular messoge they want. Our of the collephone in medical collection, its format and duration, and where the actual film of the problem could hest of the telephone in medical collection, its format and duration, and where the actual film of the problem could hest of the telephone in medical collection, its format and duration, and where the actual film of the collection to the telephone in medical collection, its format and duration, and where the actual film of the collection to the telephone in medical collection, its format and duration, and where the actual film of the collection to the telephone in medical collection, its format and duration of the telephone in the source of the leck of sifting and conrycing patients. Any output the collection to the receive of the leck of sifting and conrycing patients. Any output the collection to the receive of the leck of sifting and

The highest number of inquirles have been about paciliatries, olistetries, gynnecology, pharmacology and therapeutics. The high demond for material in dental health education is porticularly

Wellcome Foundethm and Undate
Publications Ltd. The second phase
Is due to be launched in September.

Also hased at the Dumlea Centro
for Medical Education, it consists
af an index at 4,000 films and tape
slide presentations which are avail
"This information would be invaluable to doctors for patient
detail given by some information
providers about publication dates,
video formut, and the level for
which the numerial is intended.
"This information would be invaluable to doctors for patient
detail given by some information
detail given by some information
for Medical Education, it consists
af an index uf 4,000 films and tape
which the numerial is intended.

"We du try to get compilers to

material we incorporate, but we do
try to provide a review extracted
from journals, written by tha producer, or from Department of
the lith and Social Security reparts."
Details of the presentation are
put on a cord index arranged
occording to the National Library
of Medicine classification, andet
approximately 500 subject headings.
This makes it passible ta retrieve
Informatian an any topic, such as
the cause of the lock of a tharough

"Fur example, hypertension has heen dane to death", Ms Barker soid, "but diets In be observed in disease, are nating ignored toples.
"This information would be invulnable to doctors for patient education und also in the training

If n doctor overhears one of his medical collegacy saying that he phunes Dames at least two evenings a week and writes to Mavis quite of the phunes Dames at least two evenings a week and writes to Mavis quite of the phunes Dames at least two evenings as week and writes to Mavis quite of the phunes Dames at least two evenings as week and writes to Mavis quite of the phunes Dames at least two evenings as week and writes to Mavis quite of the phunes Dames at least two evenings as week and writes to Mavis quite of the phunes Dames at least two evenings as opportunity to harder their medical, dental and least of the material themselves." Ms Gell universities, sacieties, institutions, pharmaceutical companies in the medical, dental and leath education fields.

This process has already because in the medical, dental and leath education: "We know it would be and a group af people within and other commercial companies in the medical, dental and leath education fields.

"If we can get to these people within a three mineral was provided by with a three-minimate message, in the medical, dental and leath education fields.

"If we can get to these people within a three with a three-minimate message, in the medical, dental and leath education fields.

"If we can get to these people within and the material has came from any and every source. At the manner was the prevent unnecessary duplication.

Another allificult aren has been evaluation: "We know it would be and a group af people within and other commercial companies in the medical, dental and leath education fields.

"If we can get to these people within and the material themselves." Another allificult aren has been evaluation: "We know it would be and a group af people within and a group af people within and the world the medical, dental and leath education." "We know it would be and a group af people within and a group at people within and the material themselves." Another all ficult aren has been the medical, dental and leath education. "If we can get to these people wi is extremely important in the to of all groups working on a pr

Mure oelective information of hecome available wheo the seq leorning packages oo die topics. There are already sig-

mado up of onnotated lass of references to selected joundarticles and monographs end a amoutated list of selected lime tape slide presentations.

Topica ronge from digod, for tics, epidepsy and its managers management of headads, recreat abdominal pain diskerent cardiae orrest and tesuchus; sille for collating the mach petther with a medical spokendaris of liberty to add a risk multiple and make whose ment is of inderty to and while will be an intriced and make while will be a considered. Sometimes the four-year following and there would be tails of the quality of the index source of high drams but it is still exercise.

In the fushion typical of British private, if the public (and private, if the students all used to the private, if the students all used to the private of the public to the private of the public tand priv

ledge is needed.

"It means that a dear to anish message and information. For example, it is section an epilepsy and spart, would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would only have to look at the publication of a lengthy would department by two goven ment departments proposing a complicated lentings registration the pass year all has been fairly quiet on the lodgings fraot.

Prospects for October are proposed to prelification of the publication of the long of them.

Prospects for October are proposed to prelification of the publication of a lengthy would be proposed to prelification of a lengthy would be proposed to proposed them. The scheme died and during the publication of the publication of a lengthy would be proposed to proposed them.

Prospects for October are proposed to prelification of the publication of the publication of the publication of a lengthy would be proposed to proposed them. The scheme died and the publication of a lengthy would be proposed to proposed them. The scheme died and the publication of the proposed to proposed them.

Prospects for October are proposed to prelification of the proposed to proposed them. Patricia Santa several residence a problem a group from housing competition. A several rise in the level of rents—tals they really do whisper ubunt—



the ather causes must come to an The disappearance of and.

The part of the castle which forms the college is rented by the local education authority from the Duke of Nurthumberland, and no decision has yet been made about its future:

Nearly: £250,000 was open on new huildings, including un art contre and a library just before the above.

Student housing and the effects of

government, a report that is on the one hand conjectural ond on the other statistical and ampirical is heing discussed helpind closed doors in rouditions of secrecy reinfurced by the issue a month ugo of a letter by the DES to all members of the steering committee enjoining street confidentiality.

A degree of confusion surrounds the fluid publication dote, if any, of the Kent report, and of the status of next week's meeting. Officers of the NIES, apparently briefed by members of the original Kent research team, have been working hard to bring a fully worked out political response to the meeting; the CVCP, by contrust, will not consider its view notil after the steering emmittee mosts. ing committee merts.

What the authors of the report Mr Barid Margan, a suchdigist, and Mrs Linda McDawell, a pluming specialist, say is that increasing the numbers of wanth lare implication mexpected—and by implication implication unaccentulia—social contsequences. The pature of ball higher calication as we know it, and the serial class and sex composition of the student bady, would be

From the universities' viewpoint, that is the right conclusion since it argues for similar honsing to be separated from Issues of educational policy. They reoch the cauchusion by means of a survey of student altitudes an reshlonce, travel and study, a review of the literature, a discussion of the logistics of a policy of basing students of hame, and an analysis of control of the literature.

distanssion of the logistics of a policy of basing students of hame, and an analysis of trends in the market for housing.

The survey of student atticules was carried out by a tonn of social scientists between 1973 and 1976 and is extensively written up by our of the researchers, Mr Rob Flyna, who subsequently left the project, in the Spring edition of Higher Education Review. It shows that students leave home to uttend university and college for two main reasons: to follow a porticular course of study not evailable at another institution, and out of edita to leave the parental near for a freer and mare independent life.

s residence and meals churpolytechnics and farther tolleges into cost-effective tolleges tolleges into cost-effective tolleges tolleges into cost-effective tolleges tolle

logistics of a policy of officially encouraging students to stay at houto. It outlines what this would due to the universities and polytechnics, and to various costs and benofits attriched.

I'm exactly the cost of tronsport to and from college would become a nucle bigher part of the individual of the private market in greatost numbers.

A pasteript needs to be added obout the conduct of the research that underlies the final report. In 1974, the chanceller of Kant University, Mr Ja Griotoud, MP, chase as an example of wasteful research this very project conducted at the DES's beliest.

a much dighter part of the mentional section of the section of the

privite, if the students all used carst transpart systems. Colleges would have to privide "day time" study centres, and perhaps additional romain ropos. It could inside a combersome administrative arrangement to define the limits of "local" and decide whether exemptions would be made.

two years ugo by one of its ment-hers, Labour MP Mt Michael Cocks, that it abould increase the number of hame-bosel students, but in fact such a tirnd is apparent.

such a tirned is apparent.

The report accks to show that while in lirished, the Thames Valley, or ather hig computations, it is cosy to see what a home-bosed univaristy could look like, the picture of Lancoster, Stirling or Norwich relying on their hinturlands for students is noclour. The report concludes that while such a palicy is feasible mannerically (a very high proportion of all students could attend a local advanced institution of a pinch) it is highly detrimental to higher education as we know it.

The recoption of the report at

The recoption of the report at next week's meeting will be mixed. From the point of view of the NUS. it daes pravide aumunition to oppose only mayes by the Government to increase numbers of home-liased students.

Most commentatoro criticized the Green Paper an housing policy byned of the end of Juna as connicont, largely houses in

Figuration Review. It shows that students leave home to uttend university and college for two main reasons: to follow a porticular course if study not ovailable at another institution, and out af o desira ta leave the parental nest for a freer and mare iddependent life.

The Kent survey found some interesting distinctions between students an different caurses, Most whomen students, onest arrest sudents.

The leave the parental nest for a freer and mare iddependent life.

The Kent survey found some interesting distinctions between students and different caurses, Most whomen students, onest arrest sudents.

Put is sured of the end of Juna as complete, largely hecause it tockled neither subsidies far local authority holding and letting, nor tax ralief on martgages. But that complete the parental results of the proof of the proof for students for private lettings of a risal in relations.

The Kent survey found some in the end of Juna as complete, largely hecause it tockled neither subsidies far local authority holding and letting, nor tax ralief on martgages. But that complete the present the present of the proof of the causes of the end of Juna as completed neither subsidies far local authority holding and letting, nor tax ralief on martgages. But that complete the proof of the end of Juna as completed neither subsidies far local authority holding and letting, nor tax ralief on martgages. But that complete the proof of the end of Juna as completed neither subsidies far local authority holding and letting, nor tax ralief on martgages. But that complete the proof of the end of Juna as completed neither subsidies far local authority holding and letting, nor tax ralief on martgages. But that complete the proof of the proof o

Dr Keith Hompson, MP

Tory 'task force' plans an engineering blueprint

The government has finally nanounced it, impury into the engineering profession, which will same work in the annuar. Under the chairman of Sir Monry Finniston, former chairman of the British Steel Corporation, it will look at the requirements of British industry for professional and reclusionary engineers, the extent to which these needs are being met, and the meaning mathematic of engineering institutions in the education and qualification of engineers.

By the importance of attracting them to the profession. While hearing the Government to the profession the post, however, the working party comes in the water of the post, however, the working party comes in the water of the importance of them to the profession.

The inquiry is long overdue. Engineering in llrithin has a pour image and the profession has fuiled to ottract good quality entrants far same time. The less able sixth formors tend to opply for engineering formors it and to opply for engineering courses in universities and polytechnics. And as long as 18 maints ago, a group of mechanical engineering professors from the northern universities wrate to The Times ralling for a Royal Camamission.

Perhaps the biggest Impetus to the Government, hawever, was that the Government, hawever, was their likely were being beaten to the post by the Turies. Two plants ago, the Cunserrative Party lonneched the first of what it hapos will be a serious of "tosk forces", to provide thicks between academics and policymakers in the party. Its terms of "tosk forces", to provide this between academics and policymakers in the party. Its terms of "tosk forces", to provide the first of what it hapos will be a serious of "tosk forces", to provide the first of what it hapos will be a serious of "tosk forces", to provide the first of what it hapos will be a serious of "tosk forces", to provide the first of what it haps a wider scope, with the membrashy reflects. It is a which the tumbership reflects. It will be examining the whole structure of engineering from schools to postexperience training which the tumbership reflects. It will be examine the uniture of engineering from the treated only as guidelines, fall allown, but emphasized were to be treated only as guidelines, fall intends to preserve and force of engineering from the treated only as guidelines, fall intends to preserve and force of engineering from the treated only as guidelines, fall intends to preserve and force of engineering from the treated only as guidelines, fall intends to preserve and force of engineering from the treated only as guidelines, fall intends to preserve and force of engineering from which the tumbership reflects. It is a with the tumbership reflects. It is a section to preserve and in the treated only as g

first of what It happes will be a series of "tosk forces", to provide links between academics and policymokers in the pmty. Its terms of reference: to study the relationship between engineering chiention and industry, and report back in the unusually shart time of six months.

rolve a combersome administrative mirangement to define the limits of local? and decide whether exemptions would be made.

Bubility stated, this sort of policy seems likely to be totally macceptable to the universities. But approaches to it are already being made by bullividual institutions. Remaing University recently circulated headmasters in its orea asking them to encourage the flow of their pupils to the noiversity: It was part of Reading's attempt to deal with housing shortages. The coura of Bristol University did not taken kindly to the other blum suggestion two years ugo by one of its mentions. Labour MP Mt Michael Cocks, that it should increase the number of the limits and the presidents of the presidents of the three main professiont boiles. the three main professioned heales (Institution of Production Engin-eers, Institution of Mechanical Engineers and Institution of Electri-cal Engineers).

ts original size of 12 lms expanded to 22, and also includes the chemical engineers who were left out of the first group because of the latended concentration on mechanical engineering. Dr Hompson now agrees, however, that chemical engineers are important, as they bove links with some of the major manufacturing fudustries. The

be implemented very quickly by any ndministration. The milli problem, members ogree, is that of the others of the profession, both abrond and with parents, pupils and larger, professor of applied electrostatics at South-omner Hubsperies and the appli-

fession.

The British Association inquiry is limited to the kind of people going into engineering caurses. Dr. Hampson oud, it does not examine the professional side and the status

and qualifications of professional engineers. Nor, he odded, was it

engineers. Nor, he odded, was it loaking at pastgraduate training. The Tories' working group will, however, have the benefit of the BA repurt and the extensive data and statistics which it is expected to produce. It will also use the science and technology report as a basic gride.

Professor Jahn Tharnton, head of the deportment of chemical engin.

Professor Jahn Tharnton, head of the deportment of electical engin-gering at Newcastle University, who is chalcing the tash force, and a "We shall take this report and ga through it, passibly adding some recommendations and maybe even subtracting same. While an excel-ient document, its main foult is that in the end and is left with no idea as ta haw to implement the many proposals, or what arder of

many proposals, or what arder of priority to give them,

By the end of the year, he said, the group hoped is preduce a digost of the recommendations which could

of npplied electrostatics of Southompton University, said that engincering accilent to be required in the
same light no the legal ar medical
profession. The latter hod got it
right: medicine hod prestigo, was
relatively well paid, attracted tha
obleot attudents, had longer courses
than angineering ond had the goal
organizational structure of tho
British Medical Conneil.

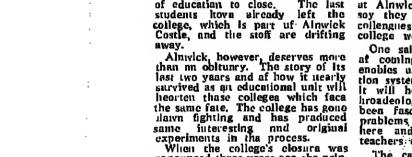
As well os the difficulty of
attracting the mare able ontracts
generolly, there is also that ef
attracting wamoo. Prafessor Boris
Cala, professor af prechanical cogincering at Leods University, oald thot
hit the Soviet Unlan, for instonce, it
was port af the notural pattern for
women to become angineers, out
they can attitude a secont problem
with which the group would be
faced: the structure of the engincering profession inself, he was very raintenced with ante-

fragmenced with only mic coordinating hody, the Council of Engineering Iostkutlans, ta cover 15 professianal Institutiona.

The graup, which hoo already hod its first nuceling, has divided itself into four aub-groups, and far each of the areas of concern in the terms of refarence, which will make had vidual reparts. Lettera from all over the conjutry have been received and aliented to the apprapriate groups, and consultations are going on with numerous interested bodies and individuols.

Wheat the report is produced, it is likely to attract of ar wider audience than just the Cansarvative Porty. Although noder the Tories' umbrella, the publicol background of the group is one of its least interportant features. Not all the members ere Conservatives, and all the members ere Conservatives, and all feel they are helping with a notional problem rather than a party poil, ileal one.





uanounced three years ago the prin-cipal, Miss Lillian Hollamby, set abaut devising new caurses which would emplay the staff "and stop

us all rattling about b'ka peas in

been tackling a programme of aut-doar colucation and environmental Americans, had had regular viols studies, o speciality as Alnwick. Lust ling the last two years," Miss mount courses for overgest students, month course on environmental and taschers, the course of the course of the course of the course of the course has been growned to the course has been growned to the course has been growned the course has been growned to the course has b

Time has run out for Alawick College, in Northumberland, which is among the first batch of college of education to close. The last students have already left the college, which is part of Alawick college, which is part of Alawick Costle, and the stoff are drifting college were not closing.

Years' exportence to students in the college of college of the seemal year and oeveral school were organized by the callege of the college of the col

One said: "The roal advantogo of coming to Britoin is that it enobles us to sea our own education system in perspective. I think it will help us professionally by hroadeolog our experiences. It has been fascinating to compate our prablems, with thuse of teachers here and to look at the woys teachers oro trained over here."

The castla and the duke were added attractions but not the unin purpose of the visit, they said. One valuable part of the caurse was the chance to teach in an English school. cation courses, and the Norwegiane hove taken up Alnwick's idea af an

Another group from Illinois has overseas in-servica course. "We have had an international community here several times dur-

and taces which their greatest success and the primary schools teachers and the success to the s

expenses for the next two years, announcement after which the college was con- ibility is that fident it could pay its own way, could become

But, although the college is used by an lacreasing number of local societies, the request was turned of the college is used down.

This meant that the cost of the Mianesota course had to go up. Tho Americans who come to Ainwick all paid their own course costs out ha university decided tha new price was two high. Miss Hollamby still feelo, that, given more time, a satisfactory arrangement could have been reached.

So the college has to college to use of the remaining at the remaining and the remaining and the remaining at the college has to college to use of the remaining at the

So the college has to clase, and ren ta a play group, international in-service training, transetlantic teaching practice and cultural activities in the standard college has to clase, and ren ta a play group. mean that there is



should be abandoned

logist of St Luke's Hospital, Guildford, has been appointed honorary profesin the department of blochemistry t Surrey University for three years. Dr Robert Ramage, senior lectorer m Liverpuol University, has been appuli-ted to a chult in organic chemistry at the University of Manchester Institute of Science and Technology.

Dr Grabam Maurice Milbourn, 8t pre-sem scalar lecturer in erap production at Wye College, University of London,

Honorary degrees

Brane!
Othic: Professor George W. Keeton, professor associate in the department of law, for his outstanding inspiration and contribution to the development of late at Ilranel; Dr Luthar Collatz, professor of mathematics, University of Humborg, for his outstanding rotatilustics to and international reputation in the field of nonreleaf analysis and his the Held of nomerical analysis and his valued assistance in the department of mathematics at Brintel in the area of finite elements; Senor Carlos Perez de misthematics at Brintel in the area of finite elements; Senor Carlos Perez de la Cura, until recently the Venezuelan Amba-sadar at the Court of St James, in recognition of his interest and support for the development of Aughover 1 are the development of Aughover 1 and State of Cara, until the Lord Killanin; Professor W. H. G. Armytage; Professor W. H. G. Armytage; Professor H. C. Darby.

has been apparented to the chair of crop-production at Edinburgh University from a date to be arranged. Or E. M. Cilve, acting head of the de-partment of Scots Lavy at Edinburgh University since 1976, has been apluted to the chaic of Scots Law, from

October 1, 1977.
The Rev Dancau II. Forrester, at present lecturer in pulliles and chaplain to the University of Sussex, has been appointed to the chair of Ciristian appointed to the choir of Christian ethics and practical theology at Edinburgh University from October 1, 1978. Mr Jahn Nortan-Smith, reader in English Imagonge and literature at Reading University, hon been appointed to the chair of English at the University of Duadee from October 1, 1977.

trade links, and in particular the rela-tionship fostered with Brumet Univer-sity; Professor Tota Killiana, professor of computer science, University of Manchester, a leading expert in British Edinburgh

Ductor honoris causa: Dr Robert A. Lillie (to be awarded posthonously).

MUniv: J. J. Zonsveld, honorary visit-ing reader in the department of civil engineering; A. P. Müchell, deadrate Ulster

Forthcoming events,

A Linguistics Festival comprising five related summer schools organized by the Polytechnic of Central London will run milli August 5. The schools will cover: Linguistics, Dysleshi and Languinge Fathology. Tronslation, and Linguistics Applied to Languinge Teaching. The schools run concurrently and ure therefore almeit at specialists only heginners. In linguistics, Further details from Rosamia Poccateria. Short Course Unit, PCL, Marylehme Road, London NWI.

A small exhibition all advetors the order.

be held at the museum from August 22-24. "The Use of Derellet Ducks and Harbones" is another symposium helms held from September 29-30. For ther information from Ursata Smart Mason, National Marilime Museum, Greenwich, Landon SE10 9NP.

Road, London NWI.

A small exhibition ill playing the rich variety of material used for withing in the East is an display in the Italian in training " is the theme of the library is gallerles (King's Library) in the British Amseum until November 20 line exhibits range from the second millenatum BC to the infectenth century, and from North Airica to China and Indonesia.

"Improving the Quality of Education section of the British Association of the Advancement of Science 190th annual meeting to be held at the china for the Advancement of Science 190th annual meeting to be held at the September 7. Further information from Tony Greener, Information from Tony Greener, Information from Tony Greener, Information and Educations of Magnetic Green, illemingham B4 7ET.

"Scientific Instruments: their social and continute settings", a symparshum magnificant in association with the British Magnetic the particular of the British Italio Spectroscopy Grup, to be held in the Carmele Information or guilzed by the National Maritime of The British Italio Spectroscopy Grup, to be held in the Carmele Information or guilzed by the National Maritime of the British Italio Spectroscopy Grup, to be held in the Carmele Information or guilzed by the National Maritime of the British Italio Spectroscopy Grup, to be held in the Carmele Information or guilzed by the National Maritime of the British Italio Spectroscopy Grup, to be held in the carmele Information or guilzed by the National Maritime of the British Italio Spectroscopy Grup, to be held in the carmele Information or guilzed by the National Maritime of the British Italio Spectroscopy Grup, to be held in the carmele Information from the held in the Carmele Information or guilzed by the National Maritime of the British Italio Spectroscopy Grup, to be held in the carmele Information from the held in the Carmele Information of the British Italio Spectroscopy Grup of the

and economic settings", a symposium organized by the National Maritime Movem in association with the British Suclety for the Ulstory of Science, will Vanghan, dept of physics, Dandee Uni-

Appointments

Universities

explicitly in its terms of reference, the working group chaired by Mr. Gordon Oakes currently considering Surrev

Shrrey

Visiting professors: Dr A. W. Edition professors: Dr A. W. S. Taman & council professors: Visiting sentor professors: Dr A. H. L. Chamberlain langer of their school population (held basis of their school population (held bas education get their casts reimbursed

Deau: Professor B. II. Roderker.

There have been many criticisms release engineering and element h. of the way the pool works, but little turers: Mr R. C. Howeringer research into its operation. It has enced: Mc G. C. Kell field: for example, been widely held to guistles and modern heres: a encourage irresponsible expansion, because providing notherides do not

Noticeboard is compiled work. by Patricia Santinelli and Pauline Downs

poter authornes and those train which few children go an ta advanced further education. And I myself have crisicized it as complimed and obscure in its workings, 19.10 Lamburg Lamburg diff. 1976; Higher Education Review,

Oakes working group on advanced further education

Why the AFE pooling system

John Pratt discusses a

suggestion put to the

in proportion to the mother of students from each authority who get advanced further education. This would mitigate the "unfair" burden on those authoritios who send few students on to AFE, and would niect some at the Lewis and Allemnoo criticisms.

A third idea is that there should be some form al judge notional and local lunding all the pool. While this would make along the poole this would make clear the national role of AFE, it would, conversely, weaken local responsibility.

weaken local responsibility.

While these suggestions meet so of the objections to the way the pool works at present, they are not radical changes. They no itself, and the only oppurating to the few rosearch gudies on in by Pam Lewis and Ralph Allemano (Higher Education Revew, Spring, 1972), especially in poorer authorities and those frain which few children go aut to advanced forther education go at to advanced forther education go at to advanced forther education at the family Travers, Tyrrell Russians and the second process of the objections to the way the pool works at present, they are not radical changes. They ilo inself, and the only oppurating for go many years to look at the family many years to look at the family fore be missed.

In evidence that my colleagues to the pool works at present, they are not radical changes. They ilo inself, and the only oppurating for go many years to look at the family poorer authorities and those frain the pool works at present, they in the

In evidence that my colleagues
Tany Travers, Tyrrell Burgess and
I have submitted to the Oakes
tracking-group, we have cancladed
that it would be better simply to
abolish the puol. Local authorists should be given back the
respansibility for all FE in thoir
areas: the aliministrative and fluoucial distinction between advanced

41 of the 1914 Education Act places the thity to "secure the provision of adequate lumber education". of adequate hirther education.

Third, the recent changes in local government organization, and the anolganization of teacher training and intriber education, weaken the ariginal arguments for profling, Nearly all the flut or so new local authorities have substantial FE provision in their areas, or could easily be developed in do so. Similarly, the institutions themselves have become larger and more self-confident with the smolganizations of colleges of education and other institutions.

Of course, provision may still be

balance was adjusted; this might hivalve the creather of joint education committees or consortia of col-

nuthorities should be left to make these arrangements themselves; no garernment prompting or action is a necessary. If an authority finds it has ton much or loo little FE provision that is itself an incentive to nogotiate with other authorities.

18.10 telement temperature of programma to second series of the continuous programma to the second temperature of the continuous properties of a university's work.

18.10 telement interfere at the continuous programma to the c

Of course, provision may still be Of course, provision may sum be ill-distributed, but this is not an insoluble problem. An ambarity with insufficient places, or too many, would need to collaborate with other authorities mail the

Nor need such negotiations stop

Further education students: abalishing the pool would pravide as

nan-inivanced student numbers question of fees: fees, in fact,

Of course, the rate support grant Of course, the rate support grant is meant to enable local authorities to spend their maney as they wish, and not all categories of local of the present orrangements. If fees are seen as a device for in the noeds olement. But advanced further education is the only major category of education.

One final happy convented to only major category of education spending excluded.

Nor need such negotiations stop there. An Lear, may wish to secure "its" provision " at a university. The Education Act explicitly onables Lears in give money to universities to provide facilities for lurther education, and it is therefore appropriate for a university's work.

This would be especially appropriate for authorities like Essox are the Welsb counties, which have is relatively few AFE facilities. It would also praced a working the provide far AFE A and of the rates and the rate support gruit; in so far as they do sa money nu AFE which was allocated on the basis of other needs, like on the rates and the rate support gruit; in so far as they do sa money nu AFE which was allocated on the rates and the rate support gruit; in so far as they do sa money nu AFE which was allocated to the rates and the rate support gruit; in so far as they do sa money nu AFE which was allocated to the rates and the rate support gruit; in so far as they do sa money nu AFE which was allocated to the rates and the rate support gruit; in so far as they do sa money nu AFE which was allocated to the rates and the rate support gruit; in so far as they do sa money nu AFE which was allocated to the rates and the rate support gruit; in so far as they do sa money nu AFE which was allocated to the rate support gruit in so far as they do sa money nu AFE which

appear in the needs element ulready constitute such a payment.

There is no need to create a new

chese terms.

One final happy consequence of abalishing the pool would be the abolition of the pooling committee. And with it would go the committee's efforts at cost contral, guidance on staff: student ratios, and other measures af "elficiency".

Thu objection here is not to con-trolling costs or to increased effici-ency, but to the mothods used. What is actually wanted is control of expenditure, and that is best dono by—simply—controlling expenditure, and that is best dono by—simply—controlling expenditure, not by meildling in the student: staff ratio or contact hours or class gives. Colleges should be left to doterming such issues themselves, within overall financial constraints. Increasing the points at which central agencies intervene results in decisions becoming increasingly remote from reality, and in responsibility boing diluted at the point where the join of calucation is being carried out the point. being carried out; it turns education from a service into an imposition.

Abolishing the pool would be one step in the reverse of this process.

The outhor is director of the Centre for Institutional Studios at North Bast London Polytechnic,

Open University programmes July 23 to July 29

Saturday July 23

inireduction to materials: The flacture of Silicon Solar Gods

Similaring of Silicon Solidar feels

9.20 Instra it into menthonalicy: I unclose

8.24 Instrain and Expenses Silicon Solidar feels

10.10 Silicon Solidar feels

10.20 Instrain and Expenses Silicon Solidar feels

10.20 Instrain and Expenses Silicon Solidar feels

10.20 Solidar its into menthonalicy: I unclose Solidar feels

10.20 Solidar its into Solidar feels

10.20 Solid

| 51 | nco and the rise of improvery | 1510: The Alkuli industry | 1511: prog 71. | Section of the respective: April | | 1513: prog 61. and 13).

schooling and socioty: Clest Kenroschooling and socioty: Clest Kenrosicono—An interview with Itali
ternsoon 1.2002; prop. 11.

inthomatics learning inn Course;
probability and stribules 5;

(AT OUT prop. 31.

Aris inimidalian Cuoise; h'ilage
Knight on liondot A100; prop.

21. Schnen Foundatinn Course: Schono-long and Hucker Explosion (Stoc) prog 221.

13.05 and Writen recommend of the state of t upo-fesse: The Labour Sacing Home \$100; prog 20; he age of recolutions: The Bongo in Innercence and Experience \$20; prog 22; when all years in the Two fortist (\$20); prog 10; the firest pitter of th The development of Instruments and their rouse: Remantic Keyhoord Park (1991) and Artificial Resident Park (1991) and Park (19

carions (Chicago) (Octoo), p. 21.1

The landicapord person in the con-putation (Chicago) (Chicago), p. 21.1

Properties of Temperature (Chicago), p. 21.1

Computation of Lags; prop 21.1

Computation of Corresponding and pull-ter; Affinese p. Inequality and flevol

in Aday:

J. Ada

CHARITY COMMISSION

Charity—The Sishop Lonadels College of Education, Herby, Derbyshire
Scheme for the establishment of Sishop Lonadels School Charity. Ref. 827028 A/2
The Charity Commissiones propose to establish a Schome for this end other
purposes. Copies of the proposed Schome will be supplied on written inquosit to
the Charity Commission. Giserna House. Gerby Square, Liverpool L2 786, queling
the reference shows, and may also be seen at that address.

Discriptions and suggestions may be sent to the Commissioners within one morth
term lodgy.

SISCO The annual Science in a Social Context Group's Summer School

will be at Colog Haitach, August 20 27, 1977. Emphasis will be upon both lenching eighbors and topics surfable for bludy e.g., Third World Problems, Acience and the Workplace, the times to Details etc. Further details all RCON, Department of Liberal Studies in Science, The University, 1724-1986; M13 981.

14.40. An introduction to previously the production of the product

7.05 * Comparison provided at the Paul 1925 : prog 111 .

2.40 * Comparison provided and Evolution 1925 | Mechanisms and Evolution 1925 | Mechanisms and Evolution 1925 | Mechanisms and Evolution 1925 | Mechanism of educative Companism 1925 | 1926 | Mechanism of education and illustration of the minister of chemistry Part 2 : The Class (1923 : mag 2) | The Class (1924 : Mechanism of Cl

experient was defined again the categories should be not a second to horse the same of the

16.40 (L.H. Announcement, 18 preferation of Vederal and Succession (Property of Social Society of Social Social Society of Social So

aiss An introduction in psychology introduction to interpret in Processing (1825); pron 110.

Thing development Polymery Associations of interpret in 111.

It is a development of the interpret in 111.

It is a development of the interpret in 111.

Soviet preyroment and politics interpret in the Societ Interpret Some Views (1135); prog 0).

88C 1
G.00 Clemonlary mathematics in science and leclandery Stodelling Plaste 19c, alls (19k) 115.

7.05 Performance 19c, and 19c

1.30 in Chicago Hittsii ; prog 11).

80C 2
0.40 An apprilimit Alistoch in roundating that (M21) in our organism : free indicates the incomplete and electronic and the Myunchima : free indicates the incomplete and electronic and the Myunchima : free indicates the incomplete and electronic and the Myunchima : free indicates the incomplete and electronic and the Myunchima : free indicates the i

STUDY ATHON

for o London Union DEGREE Workey Hall, the only conversed to the reads of the Land and full countries for the reads and reads and reads a territory lateral & deposit and reads and re

individual but some of set of the services - a pass rate of set of real services - a pass rate of set of real services - a pass rate of set of set of real services - the real services of the the goal professions from the Pavid Tree prospectus from the Pavid WAI VI Milligan MRE, 1D, 3th, Days DAI, Volsey Hell, (1) Chief (1)X2 6FB, 1231 Telephone (0905) 51231 (Annafone ofter 4, 8, p.m.) Woisev Hallo

towarding ver. Preside f

Typical transfer of experience should be individual entrepreneur internal content of the content

the in his early days as a trial the effort of season as a trial on cash-flow in the club the pastgraduato diplomativant studies.



The transfer of experience should perhaps be measured by a resourch perhap

so to be modulighting in a side accountants. One company is the first of the stimulus to the studies.

The partively few in number.

Staff whn modulight do, of course, containing it is the studies.

Staff whn modulight do, of course, containing it is the studies.

Staff whn modulight do, of course, containing in their colleges, the most obvious being a conflict in the time-table. Conflict in the time-table. Conformation in the club is students will just have to muck in together more or fortunate in having persuaded so and she students will just have to muck in together more or fortunate in having persuaded so and the effoct of season is students. But most teaching to most useful.

This technique works quite well, the stimulus of modulighting as a successful is the hull.

change from runtine to he indulgent about time-table changes. The test amust be whether the students benefit.

Sumctimes pracedures for closing runks, seem unduly formal: applications in writing to the professor or dawn, for example, but no doubt helegendary lecturer whree students benefits.

To deal with persistent imbalance, one sophialicated group of locturors the cannot hecauso of the legendary lecturer whree students of the context hours were all deployed in weekend courses and evening seminary for postgraduate students working in industry. A five-day winking week available for moon-lighting, airractive as it may seem, is estatinable only whore reoching is on a context postgraduate students in farminal methods of classing ranks are more satisfactory than formal applications in authority, if only because the latter seem to invoke the cannot be removed the context of opportunity with the context of opportunity in the college of the moon and the term by payment at the found fair its services. In addition the car out.

Infirmal methods of classing ranks are more satisfactory than form a are more satisfactory than formal applications in authority, if only because the latter seem to invoke continue should be enhusiastly and student some luint of opproblium whore some luint of opproblium whore some luint of opproblium whore continues and contraction and contract hours are continued to a contract hours are contracted by the work and the professor of the college company to applications in authority. If only because the latter seem to invoke the contract of the professor of the college company to applications of the contract of th

and sn to speak to you, and we are sure you'll find what he has to say most useful".

This technique works oute well, provided the opportunities are more. The most dispartment. Those who have but to not a college-awned company to modest moonlighting practices will institutionalize staff consultancies still wish to attend conferences or and contract research. He greets in not acceptable, and to oppear to be acceptable, and to oppear to be furtive is putting the wrong completely which is beneficial to elight and college. The most distributed in the true modelighter is the furmation of a college-awned company to modest moonlighting practices will institutionalize staff consultancies still wish to attend conferences or and contract research. He greets

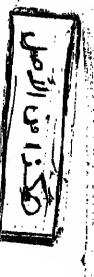
At the other extreme, to keep At the other extreme, to keep one's contacts to onescif is not acceptable, and to oppear to be furtise is putting the wrong complexion an activity which is beneficial to client and college.

How does an a obtain an invoice, much less an estimate, for using the torque-testing machine? Can a firm booking be made for computer time between 10.00 and 11.00 hours on Saturday, and what will it cost?

discussion implied a breach of security.

I would have liked to reconcile rheir points of view, for there could have been a camouflage of material and o change of location, and them the atudenta could have benefited fram learning about the principles or techniques made. My boas's romark was, however, too much of a strain on the client relationship and the job was lost.

The trend towards companies may, however, solve the lest of the problems of moonlighting to be considered here. In engineering departments on decidered here. In engineering departments on decidered here, in engineering departments on decidered here. In engineering departments on decidered here, in engineering departments on decidered here. In engineering departments on departmen poorly managed as sub-contractors,



North American news_

The controversial claim of a white student that he has been kept out of university by less qualified blacks may affect every college in the country.

Discrimination in black and white

" rocially-conscious" means for

increase minority admissions) because it concluded that nothing

But, says the brief, the Dovia pro-

All students admitted are fully

qualified, although some candidates

in the special programme have grade-point averages helds the cut-off figure for those in the general

"The assumption that students

with the highest numerical indica-

tors will necessarily be the best doctors is completely questionable", the UC brief says. Test scores and

college grade-point overages do not correlate that well even with initial performance by medical school, let

nlune with subscoueut clinical train

The court advocated admining

ing and experience.

A spring of adverse consequences both for the education of racial minarities and for universities themselves would flow from acceptance of "raverse discrimination", several Indied States universities have claimed to lariefs submitted to the Supreme Court.

the supreme Court,

Minority students would dwittle
in numbers and professional schools
would once again become white
euclines, the briefs say,
As for noirersities, if the principle is established that the courts
know haver than advances who

know hence then educators who should be admined to graduate schools, this would represent usovere slap in the face for univer-

The dispute before the Supreme Court involves Allan Bakke, a white male from California, and the medical school of the University of Cali-

Mr llakke claims he mas twice rejected from the school because 16 places out of every 100 were reserved for edinic minorities, planough, in must cases, he had nithough, in must cases, he had higher test scores and was there-fore better qualified. In 1973 and 1974, the years that Mr Bakke applied, 31 out of 55 utinarity students admitted to the course were "special admissions".

The Colifornia Supreme Court, ruled in Mr Bokke's fevour, snying it was just as unconstitutional to violata the rights of pon-minorities as it was to discriminata against minorities.

admicroints programme, the University of California appealed to California in the case will be heard in October. A decision will be handed down some wooks, or months, thereafter.

The decision will be montentous for United States higher education and it will probably have ramifications for much of the country's civil rights legislotion and practices.

Last month the University of Cali-fornia submitted an 87-page brief to the court. At the same lmo, four private universities— columbia, Harvard, Sumford and tha University of Pennsylvanta—sub-mitted 40-page "Friends of the Court" briefs which and the "gesteral support" of five other private universities—Brown, Duke, Notre Danc, Vonderbilt and Vila-

The briefs often edvance similar arguments. Three common themes ore the reason for the policy of ore the reason for the policy of special edmissions, why the alternatives proposed by the California Supreme Court are "Illusory" and the effects acceptance of the Bekke case would have on universities end

minorities.
Underlying the policy, says the University of Californiu, is the need to compensate for the effects of societal discrimination un historic-

The restity of Californiu, is the method of the state of the rorting of instances of t

tioned Imperatives and the pressing needo in the professions and the largar society", the brief said. At Davis, the faculty chose say. lan Anderson reports from California on the growth of sociobiology

Beastly man

Suciohinlogy, n form of acodemic reasoning which montains that human behaviour is influenced by gones at least us much as it is by the environment, had its first union public uring in the United States

Bur, says the brief, the Dovid pro-gramme sets in goal and not "an institute quota". The modical school does not what applicants in order to ensure that each catering class comains a particular number of minorhies—if it a given year fewer than 16 well-quotified special applicants are avoitable for admis-sion to Davis, the gowl will not be ties and altruism, are genetically shaped and are inherited from mankind's aulmal incestors. Culture may redirect these types of behariour, or even outlaw them, but it can never eradicate them.

Using the study of animals and insect societies as stepping stones, sociobiologists claim that human through processes akin to Darwinian

The consensus at the meeting was

some cases, on hostility. Students held a small but rowdy demonstrathat when the symposium began. The critics fear that saciabidings

could provide academic support for the idea that human intelligence, us well as hehaviour, is fixed in the gene, thus rausing some groups in suriety to be labelled as genetically

inferior.

The futher-figure of sociobiology is E. R. Wilson, professor of routingy and curator in entomology at the Museum of Comparative Zonlogy at Harvard. Wilson's 789-page tome published in 1975 Immediate discipline and the debate in

Duited States universities.
Professor Wilson did not attend
the symposium, but socialinlogy was
represented by its main popularist,
Dovid Barash, associate professor
in the departments of psychology and cooling at the University

It in mouth.

The occasion was the annual meeting of the Parific division of the American Assorbation for the Advancement of Sclemes of San Francisco State University.

By linking behavioural studies, sociology and genetics, sociology and genetics, sociology and genetics, sociology behavioural studies, sociology and genetics, sociology behaviour, with little or in knowledge of biology.

Sociology has hit two seasoive nerves, according to Dr llorash; arademic territoriality and political beliefs on such things as racism and soviem. and sexism.

"Although sociobiology is based on the work of biologists, it is quinessentially interdisciplinary", Dr Byrash said in an interview at Smi Francisco State. "It purports in have comething to say in authropalagists, socialugists, psychulogists and philosophers who, to some ex-tent, feel threatened. "We have used our discipling.

selection.

biology especially evolutionary biology and its basic approach of scepticism, burdering, in genetic influence on helavious, to

disciplines.

" Acadentics in the sac' I sien who have generally cast their is feel personally threatened bene-if suciobiology as right then mad of their emphasis is no.

For Itr Burnsh, suciobiology an "antidate" to racism. Sochindagy deals with the modeling bindings of characteristics that unit all huntan species from the Ka Yorker to the Australiao obodio "We are asking what is his

Third world commerces is being threatened by restrictions in public spending. This is the conclusion reached by several associotions beinging together teachers and makes huomans human, what is that relates us cell, as opposed b cultural diversity that makes a different ", he said. ecturers working abroad. At the symposium one of side The French uversens aid pro-gramma is based on bilateral agreesciences' strongest defenders to unthropologist Professor S. L. Wie ments with Third World committees in the areas of technical assistance.

hard, from Herkeley, He solder hy positive the positive the hypositive the help the hypositive t an me areas at accument assistance, scientific cooperation and the staffing of the rapidly growing university sector. The letter is especially important to the Arab connerties. ln many waye similar to the Voluntary Service Overseas system in Britain, it also embraces recruitfor more than a century. Professor Wasburn lymoed Wha with Ardrey, Alurris, and tac.

saying that they had all comes on a fashionable interesting in higher education. The Barre plan, designed to put France back on the road to econo-mic recovery, has had several unforeseen side-effects on overseas hehaviour und applied i telea Saciable logy's reliance mas-theory might be assell bets conficiation. The numbers of staff million years ago, but the their could not be applied to be applied to be listery of the past 2,000 year Language in its million forms, sorial customs ad their and political systems could only applied by course be sid by conded to overseas posta linve been reduced and there has been a dramatic fall in the number of high-level academics opting to take part in the Overseas Development explained by genes, he said to guage laid the basis for he ick pondence of social science from a

This has been particularly notice-able in Algeria and more specific-ally in the oren of sclemific operation. Last year, for instance, Algeria asked the French Government tu send 700 teachers. Only 300 came lorward.

Cutbacks hit

France's educational assistance to Third World countries is being

overseas aid

to colleges

from Guy Neave

Some of the long-term consequenes of government restrictions were spelt out recently by the Association des Professeurs de l'Enscignement Superieur, o body offidated to the Communist-led Spudicat National de l'Enseignement de l'Enseignement

Changes in conditions of tenure in France, the association argued, will mean lewer top-level ocademics will manage to find an equivalent job open to them when they relive home.

'Zero growth'

parents are challenging profession for the Federal Opposition spokesman

and in limits on funds for the contraction of the contract of demic matters.

The technical ond further string sector is to get a 10 per last senator. Wriedt says that then zera Browth the freeze decision making bodies and that of state and colleges, probably the also attacked the form in 1978.

The KUTA charges that leaders by elected by teachets have dailberately the been kept out of the university's of decision-making bodies and that of state bureaucrats and university factorums have established a tyrunny. Some members of the caucus are supposed to belong to

Congress chickens come home to roost

emergency rule in India are now feeling the draught A. S. Abraham reports.

Universities which

backed Mrs Gandhi's

BOMILAY A tidal wave of demonstrations in protest against what is referred in as the "excesses" of the erstabile as the excesses of the erstiving Congress regime during the 20-odd months of emergency rule has been sweeping across the country since the general elections to March were completed and the new Government installed in office.

Inevitably, compuses are very much part of this surge. Mevitably, because the emergency was used to keep otherwise militant to the control of lised to keep otherwise militant teachers and students in line by locking them up or harassing them and ity coming down hard on teacher and student organizations which did not toe the line.

thinks, it is said, to the disclosures of resident infornters.

The "excesses" covered enauge of measures: the tronsfer, demotion or dismissal of teochers and officials, the suspension of standent union octivities, including elections, the establishment of "unentable" partilel teacher and student bodies, the introduction of special courses and textbooks on tha "20-polat programma" of the former Prime Minister, Mrs Indira Canadhi, the strengthening of the honds of college and university monogements at the cost of the employees, the imposition of stiff terms and conditions of service on teachers, including a "code of condect" (of which more later), without consultation with their representative bindies and the emergence on a unicro-scale while training of the limits of college on the country.

Not surprisingly, a number of vice-chancellors were also with the college of the country. It as ents only appropriate, therefore, th

Not surprisingly, a number of vice-chancellors were deeply involved and, following a worning given by the new Federal Education Minister, Dr Pratop Chandre Chuader, many heads are expected to roll. The first has obready dune so: that of the vice-chencellor of Bomhay University, Mr T. K. Tope. Following a persistent campaign by a militant group celled, quite simply, the "Tope-Hetso (Rentove Tope) Committee", the vice-chencellor has been persuaded to go on "sick leave" indefinitely and a new incumbent named to replace him until a permanent appointment is Not surprisingly, a number of

until a permanent appointment is

made.
Aport from being charged generally with being a "chomcha" (a Hindi term for a lockey) of the Indiro Gendil regime, Mr Tope wee ettacked perticularly for introducing and writing the preface to a special laty textbook on the 20-point programmo.

Immediately after the emergency tyrs declared, the university dis-solved the RUTA and put a lock on its campus office.

The provincial government then stepped in and dissolved the syndicate, a democratically elected body, through un ordinance which provided for the establishment of e substitute, nominated syndicate. Other decentralized bodies like the depurtonental and college councils, were also closed down.

which did not toe the line.

Not long after the emergoncy was declared in June, 1975, for example, the leaders of the Bombny University Teachers' Union, which had urganized on examination boycot only a few months earlier to press for the provincial government's occeptance of the revised poy scales recommended by the University Grants Commission, were jailed.

And of the lawcharlal Nehm University in New Delhi—a pressingious inatitution known for the pronounced leftish inclinations of a large number of its stoff and snudents—many arrests were made thinks, it is sain, to the disclosures of resident infornters.

The "excesses" covered opposition took other forms as well. A new rule was introduced under which o tencher could be campulatorily retired os soon as he campulsorily ret

Shuilar turbulenco la evident lo the country. It seems only appropriote, therefore, ther the person
who ubove oil was responsible for
the energency, Mrs Indire Gnodial,
should nut go unscathed. Nor will
she, if the Jawaharlal Nehru Unito versity Students' Union has its ivoy,
it has demanded her dismissal as
Choncellor of the University.

The most contentions compus issue before the emergency was the enforcement of the ravised poyscales for university and college tonchers. (The former are those employed directly by a university, the latter ore on the stoff of colleges offilioted to a university.) offilioted to a university.)

offilioted to a university.)

The scales, proposed by a UGC committee, lied been recommended for implementation by the Federel Government in 1974 with retrospactive effect from January 1, 1973. The provincial governments were, under a formuls, expected to bear only one-fifth of the additional expenditure, the belance being borne by New Delhi. But this arrangement would be only for five years. After that, the provincial governments would hove to pay the full cost.

This formule has not worked well

(a Hindi term for a lockey) of the Indiro Gendlii regime, Mr Tope wee ettacked perticularly for introducing and writing the preface to a spocial lary textbook on the 20-point programme.

In the north, the Kashmir University Teachers' Association has been conducting a campaign over

In the state of Rajasthan in research and their high over pearliers.

In the state of Rajasthan in twestern India, the Rajasthan University Teachers' Association has rome on strongly against all those responsible for "oppression" aduring the emergency. They have demanded the resignation of the vice-chancellor, Dr G. C. Pende, whom they consider to be the sale of the uppressive rule of the "oppressive rule" of the "oppressive rule" of the campus thring the campus thring the 20 months. change the remaineration that can be earned by teachers, managements interpreted this to mean that teachers could not be paid for examinerships under the existing system of examinations.

l'erhaps the most obnoxiuus condition of service sought to be introduced hy many universities conte, a democratically elected body, through un ordinance which provided for the establishment of a substitute, noninated syndicate. Other decentralized bodies like the departational and college councils, were also closed down.

Oppression took other forms as well. A new rule was introduced under which a tencher could be campulsorily retired as soon as he reached 50. The RUTA claims that one tearher and une non-teaching

the margin on the left-hand side of the manuscript was narrowed than the rules prescribe.

In misinterpret them to lighten in government colleges, but not in the colleges of private colleges, but not in the colleges in private colleges, who continues the colleges in private colleges, but not in the colleges in private colleges, who continues the colleges in private colleges.

over attempts to link them with revised terors and conditions of service and over the introduction of codes of conduct have become the chief sources of campus discontent once again. And this time, the boot is on the other foot, with teachers' bodies confident that the new government is an their side. Some time ago, the All-India Federation of University and College Teochers' Organizations announced it would some nizations announced it would soun faunch a campaign on these issues.

The other major problem which college teachers face is the adjustments which the new three-year first degree concso are making necessary. Under the three-tler formul education structure being adopted throughout the country so as to bring about a majoral conas to bring about a national consistency of educutlonal provision, 10 years of achool are to be followed by two years of higher secondery school followed, in turo, by a three-



Congress election poster : the voters were not impressed,

sity/college suob as a classroom, library or laboratory, semluar end ayminosio to propegate his own ideas or beliefs for or ageinst a particular theory or school of thought or elignment of political parties."

And it was not so much the nul-versities themsalves which drafted a code; surrendering their tradi-tional outcoonty, they acted at the beliest of the provincial govern-otems whose aim was to use the beliest of the provincial governntents whose sim was to use the
emergency to suppress dissent
omong the intelligentsio, in keeping
with the "spirit" of the emergency.
The code for the six universities
in Mehereshtra state, for exemple,
lays down, amonts other things, that
"e toecher will have freedom of
academic thought and expression
provided that he will not use the
facilities or forum of the noiversity/college suob as a classroom. The new arrangement means that The new arrangement means that collegee have a quarter fewer etudents then they used to have. This means a reduction in the staff so that mony teachers face retrenchment, especially those new to the profession or those in faculties which attract few students and which colleges tend to close down first.

One solution being tried out is to

One solution being tried out is to split the two years between school and university, known as the plustwo etage, between schoole and colleges. Since the higher secondary course cannot be housed in ery course cannot be housed in separate buildings (the cost would

particular theory or school of thought or elignment of political parties."

Ageln, "e tencher ... shall not disrupt or ceuse to be discupted functions or activities sponsored or authorized by the univarsity/govaraling body/college." And on third: "a teacher sholl not engage blimself in any act prejudicial to the interest of the mangement of the interest of the mangement of the college or me university and go against university rules?" The state teachers body challenged these conditions of service lo a court of law end won an in-

disadvantaged abulents without regard to ruce, but the University of California clotmed that this pendid do little more than substitute Shake-up for Canadian less affluent whites for more affluent whites become whites greatly nutnumbered minorities ut every research bodies

irom Edward Sheffield

Logislation authorizing reorganizaprovide support for research has been concted by the Federal Parllaonnounced its intention of guiding research in directions related to atiunal Isaues and objectives.

There will henceforth be one granility council supporting medi-cul research, one for the natural sciences and engineering and me for the social sciences and the

An Inter-Council Coordinating Committee (ICCC), consisting of the heads of the throo councils, with the Socretory of the Ministry of State for Scionce and Technology as chairmon, will report to the Minister of State.

The University of California fears the Bakke case will set a precedent "The California court exceeded the judicial function in substituting its judgment for that of educetors and for that reason alone most be reversed", the UC beief declares.

The private universities in their brief told the Supreme Court that "the rorlty of Instances of judicial intervention in accedemic affuirs proves the rule that governmental displacement of the authority uf those primarily vested with aca-In o stetement, the Minister, Mr

gremmea should confinue if our lawed in the stete system.

Both briefs forecast an abrupt the Bakka case is upheld. Both hriefs also sea special admissions programmee as transitional. "One of the very purposes of teking inlinority status into eccount in admissions programmes is to speed up the time when that is no looger necessary", the private universities and social Sciences and Humanites and social society of the arts will continue under the Canada Council. Support of the arts will continue under the Canada Council. Support of the arts will continue under the Canada Council. Support of the arts will continue under the Canada Council. Support of the arts will continue under the Canada Council. Support of the arts will continue under the Canada Council of the arts will continue under the Canada Council of the arts will continue under the Canada Council of the arts will continue under the Canada Council of the arts will continue under the Canada Council of the arts will continue under the Canada Council of the arts will continue under the Canada Council of the arts will continue under the Canada Council of the arts will continue under the Canada Council of the arts will continue under the Canada Council of the arts will continue under the Canada Council of the arts will continue under the Canada Council of the arts will continue under the clevision deanas are u substitute that or or overy few good navels. Support of the arts will continue under the council of the arts will continue under the c

Court rejects concept of consumerism in education Ethicaring young people was sale

from Angela Stent

HARVARIT same as "building o house of der or automobile".

The judgo further organization At a nine when "consumerism" is a growing trend in American higher the agreement between a set adjustion, the University of Beidge and a college "is not the sent port hos just won a test case in a sent ordinary building contains." suit brought against it by a former student. The rourd's decision in favour of the college was greeted which in guide and derect which in guide and derect which relief by most pulmerate at with relief by most university ad- reasoning and intelligence of

The case involved a student de numbing a tuitlon fue relate had not bournt what the college cataling had promised in a context which she took.

Ms Flore Level.

which she took.

Ms Elene handello curalled three educators about the content of the Federal Opposition spokesman to the first and in teaching high school business courses. As part of her study, she took the required education, course, entitled "unchods and materials in teaching the mujor fields".

In her cubsequent sait, Ms laminello complained that classround time was spent with "the instructor reading aloud pamphlets and attermateriels clready distributed in the closs". She sold that assignments consisted uf summarizing textbook chapters. She asked the university to return her \$155 in tuition and other fees.

The court ruled that colleges do not provide causancer services in the ordinary sense of the oard.

Ottoren, Ontarto, or Associ 151 Slater Street, Ottara

Obtainable from: Statistics

Universities and Colleges of Co

Published quarterly by The Times Higher Education Supplement in conjunction with The British Association

In this issue

This issue of British Association is devoted Professor Sir Andrew Huxley, FRS, dis-

to various aspects of the work and activities cusses both the association's current activi-

of the British Association for the Advance-

ment of Science. The first three articles are ing about attitudes to science in his presi-

each devoted to topics being considered by dential address to the BA's annual meeting

separate BA study groups, although in each at Aston University in Birmingham, from

case, while the author is closely involved August 31 to September 7. The last four

with the work of the group, the views ex- articles are each written by contributors

pressed in the articles are entirely his or to the annual meeting, and are intended to

MIGHER EDUCATION SUPPLEMENT New Printing House Square, London WCTX 8EZ, Telephone DI-837 1234

A room of their own

that the question where they are in stay toght to be discussed.

The authors of the Kent report seem convinced of the need to head off DES plens for a major shift in poliry torurds encouraging or even compelling students to opt for their nearest college or university.
Whether such a poliry change is within the realms of pulitical possibility or uni, the argoments about where stodents should live while they study need rehearsing—illough the thousands of punits and research must-hunrs spent by the DES in doing it seem excessive. Work by Gareth Williams and collaborators at Lancaster Univerdiv has elearly shown that students do not leave home for college on the quest of some grait of learning. They do it for well-defined reasons They do it for well-defined reasons because the coorso lines then up for a particular job, because of the institute's ocalentic repotention, or because the rollege promises a good social life. The last point is important. Many children of middle-class homes would probably leave their parents' house at the age of 18-plus anyway and what the 1960s boom in higher education did way tropy the centres where rarily away from the centres where they would eventually find permanent emphyment. In many cases the student housing problem is not so impute a so in the housing etock sitable for young people as local imbalances in the housing market. If so, a notional scheme to regionalize higher education could go sadly wrong because it impured important

wrong because it ignored important local variotions.

Most of the points made in the sume years there is no absolute Most of the points made in the report on stodent housing prepared at the University of Kent for the Department of Education and discussed on page seven this week are not new. Because few students will start the new neadenic year in October sleeping on floors through a shortage of rooms, the issue may seem to lack argency. Yet it is now, before the especied larrease in sundern manbers in the 1980s, that the mession where they are the home towns. Their parents are then home towns. Their parents are then left with "empty" rooms. A national homsing pulicy would have an devise means at bringing bark such "empty" space into housing use; otherwise there is the reality of an excess of people wanting to set up households over the supply of household mits. Of course, stodens are only part of this problem. The excess demand our denis are only part of this problem. The excess deniond, pur-ticularly in the urban areas, is made up of young people in gen-eral, mobile workers and low-

income families. The Kent report rightly snys there is a need to pro-vide for this group as a whole. Discounging the mobility of sm-dents is neither on answer to the housing problem nor, in an economy where the mobility of lubuar is a precondition for growth, is it

wise.

The main question underlying the canclusions of the Kent report is whether practical matters of where stadents should live aught to impingo on higher education policy. It is nousense to suggest this has not happened in the pust (witness the slung of the new universities). It may be that in future the University Grants Committee has to take an imadequate supply of student housing into account in

a far cry from the major regional-lization scheme the Kent outhors fear. In the meantimo if the report prompts educationalits to take a wider view of housing and place students in the morket olong with other needy groups it will have been worth while.

Approaches to Soviet science

This mouth the Soviet Union and the United States of America agreed to renew their scientific exchange programmes for another five years after o remarkably cordial meeting of top-level scientific delegations in Washington, and President Carter Washington, and President Carter took the opportunity to get in n friendly talk with the leading Soviet negotiator Academician Kirillin. At the same time in the United Kingdom the Council of the Institute of Physics was publishing a letter to the Royal Society, the British agent for Anglo-Soviet scientific exchanges. Written by the institute's immediate past president Sir Brion Pippard, it asked the Royal Society to scron our exchange Royal Society to scrap our exchange agreement with the Russians unless they stop persecuting dissident scientists (see bark page).

The letter criticized in fairly strong terms the alleged weakness of the Royal Society's current these of the Royal Society's current

strong terms inc alleged weakness of the Royal Society's current of the Royal Society's current of detached policy on the issue; is sensitive to cries of belp from the issue; is sensitive to cries of belp from by the public? Soviet Academy of Sciences with the south of the base of the first personal personal personal behind the base by unfair, ingling out the scenes on basis of dissident Soviet Union. At present, for co

scenes on beneat of dissident scientists.

Now that the Americans have rappily signed up for five more years' cooperation, it would clearly be damaging end futile for this country to make an heroic goltalone gestuce and wreck the personal relations built up over many years between its scientists and their collecgues in the Soviet Union. The Royal Society would suffer internal damage, for the move would upset many of its fellows and could cause a schiem. More importantly perheps, the dissidents themselves would suffer, for the visits of Western colleagues provide an important lifeline for responsible. antly perheps, the dissidents themselves would suffer, for the visits of Western colleagues provide an important lifeline for refusnik eclentists starved of Information by their Soviet comrades. (Nearly 200 foreign scientists are thought to liave attended meetings of tha Moscow "Sunday Seminor" held by Jewish scientists deprived of their official lobs and not yet allowed to such as the light time about perticular official lobs and not yet allowed to solve the seminor of the loss and not yet allowed to solve the seminor of the loss and not yet allowed to solve the seminor of the loss and not yet allowed to solve the seminor of the loss and not yet allowed to solve the suntorities end the University Graots Committee. The same the demand to part-time law studies. School of research in education to part-time law studies to the authorities here on mountaints and regretable. School of research in education to part-time law studies that the authorities here on mountaints and the suntorities here on mountaints and the suntorities and the University Graots Committee. The simply that the university contributions catering exclusively fur that the authorities here on mountaints and regretable. School of research in education to part-time law studies that the authorities here on mountaints and regretable. School of research in education to one-existent, which, with two sumprising and regretable. School of research in education to one-existent, which, with the surprising and regretable. School of research in education to one-existent, which, with the sumtorities here on the university contribution to part-time law studies. School of research in education to one-existent, which, with the sumtorities here on the suborities and the university contributions catering exclusively fur that the university contributions catering exclusively fur the sumtorities and the university of the sumtorities and the university contributions catering and regretable. School of research in education to one-existent, which with the sumtorities and

Beyond the Immediate horn that the severing of scientific relations with the Soviet Union would inevitwith the Soviet Union would inevitably cause, lies the argument that international cooperation and onderstanding are exceedingly precious and vulnerable assets to be nurtored at almost any cost. Scholars and scientists, who depend so heavily on personal and written communication across frontiers, should be the last people to propose cotting the few lines of communication with a relativoly closed society. n relativoly closed society.

But there is, of course, a middle road between the Royel Society's present reductance to make any public condemnation of Soviet repression, and the Institute of Physics'a proposals for o formal scientific break with Moscow. The society could and should be bolder in speaking up for presented scientific so large occurred. amplo, sclentists in two or three South American countries need the help of the international scientific community still more urgently than their better known Rossian collegates.

community still more urgently than their better known Rossian colleagues.

Certainly the Soviet nuthorities are behaving outrageously towards scientists who are allowed neither to leave the country nor to work in it, and the Royal Snelety should sny so. But aven here political skill will be needed to avoid making especial case of Jews wishing to go to isroel.

Certainly the Soviet nuthorities Sir,—Frances Gibb's orticle "Keopling soma of Britain's oldest known lenguoges alivo "was very timely (THES, Jone 17). That situation is of Celde studies in English universities, as set out, leads to the consideration that racielism has another espect: cultural recialism.

What should be a respected if is small segment of "British" culture of is outrageously neglected by the university euthorities and the limit

LETTERS TO THE EDITOR

Annan versus AV

Sir,—Your recent correspondence (THES, July 1 and 8) regarding the cost-effectiveness of ambio-visual laps onesual because it touches on Sir,-Ynar recent correspondence (THES, July 1 and 8) regarding the conseffectiveness of ambio-visual education bringes directly on the question of evidence. Countering Lord Annan's view that the educational value of the ambio-visual media remains to be proved, Mr Geoffrey Hubbard states that favoorable evidence of their worth, both educationally and be terms of cost reduction, is indeed available. This unfortunately is not quite eribbare in view of other good eribbare, like the Open University, adds to the total national bill. At first glance it dones on emotional motters. But it is worth studying. In the past 18 months, onver 100,000 adults have enterged and asked for help in remling and withing. Of course this result is not due solely to broadcasting. But the catalytic, recruitment and stimulating effects of broadcasting are widely ucknowledged. The national literacy scheme, like the Open University, adds to the total national bill. At first glance it does not save widence in the contrary.

A lang-term project at the Memorial University of Newtonink land, for example, has recently revealed "quite clearly man the live lecture produces a significantly higher level of achievement . . . than do either videorapes of live chan do either videotapes at the lectures or studio-produced videotapes of live lertures produce a significantly higher level of achievement than do studio-produced videotapes", if it is evidence that is to devide the then both sides of the organiem will have un be considered.

Yours faithfolly, JON BAGGALEY, Centre for communication studies, their estimates of Liverpool.

Sir,—I refer to your report of Lar Annan's remarks on the subject of the economic worth of andia-visual aids in eduration. The field of mudio-visual aids is very wide and there are many romeributors. So, in confining my remarks to educational broadcasting I should like to rom-ment briefly on three ospects of

The Open University uses broad-The Open University oses hroadcasting as me means of communicating with its students. Some say
it does not need it and others say
that the university has yet to use
it wholly effectively. Whatever the
it wholly effectively. Whatever the
thousekeeping forta about the
Open University ore well known. It
has by any yardstick proved to be
an extremely effective way of providing mults spread over the rummundy white education of a high
standard. The Open University may
not have saved the nation money
hut are a distance learning system,
Involving broadcasting and other
oids to learning, it has, in my view,
led to the development of an
extremely economical distance
learning system.

If yout think in terms of distance
study systems, then you begin to
think ogain. And you get stway
from what I think is the oth
fashioned idea of audio-visual aids.

The IBC spends E8m of public
money from its licence income on
the University may
be the visual aids.

The IBC spends E8m of public
money from its licence income on
the whole of the education
and the whole of the education
system, I suggest that one gets a
fresh wice it is the other.

They use think in terms of distance
study systems, then you begin to
think ogain. And you get stway
from what I think is the oth
it what I think is the strong from what I think is the oth
it what I think is the strong
from what I think is the strong
from what I think is the strong from what I think is the strong
from what I think is the strong
from what I think is the strong
from what I think is the strong
from what I think is the strong
from what I think is the strong
from what I think is the strong
from what I think is the strong
from what I think is the strong
from what I think is the strong
from what I think is the strong
from what I think is the strong
from what I think is the strong
from what I think is the strong
from what I casting its one means of communi-cating with its students. Some say

Self-renewing libraries

Sir.—According to recent press reparts, the vice-chancellors of the universities linve issued e statement opposing the recommendations of the Atkinson report on "self-recewing" librarios.

recewing "Bbranios.
Six months ago, you kindly poblished a letter from ma inviting the noiversity librarians—who had olso opposed that report—to discuss "self-renewal" and to examine how one library proposed to implement the recommendations. Not unexpectedly, the response has been mile

the recommendations. Not unexpectedly, the response hes been nil.

Do not the universities and their vice-chancellors have some duty to examine both sides of a question before pronouncing judgment, particularly when their own solu-tion, the status quo, involves conthreel heavy expenditure of money which has ultimately to be provided

Librarian, Teesaide Polytechnic.

Celtic studies

Middlesex Poly directorate

nor due solely to broadcasting. But the catalytic, recruitment and stimu-lating effects of broadcasting are widely acknowledged. The national literacy scheme, like the Open Uni-versity, adds to the total national bill. At first glance it does not save the nation attoney. But as a viable and economic system of non-formal

The suggestion that the possible for the directorators minicate thering the autoparion is just plain nonges. the postponement was sell as deal despite the fort that de to

learning system involving young children, parents and tearhers, seems to be unrivalled.

What I am snying, in ching these three examples, is that the term "andio-visual oids" communicates the wrong way of thinking in relation to adventional beyong any incommunicates. working.
The governing body did at a plete the opendar item on the tion to educational broadrasting. What the discussion should be about is the emergence of a variety of reaching and learning systems, early reasonably flexible and early designed to the style of life of the

JUHN SHAW, Covernor facademic board, Albidlesex Polyrechule,

Practical year

Sir.—Question: "How do years a year of related practical execution and a degree course (for example industry or the Civil Series). This would imply a fearer murse instead of three years.

Answers (In percentages) from sixth formers in pine Yorkshire schools: Dnilesirable Kather undesirable Not important

Antractivo Essential

Yours faithfully, Padraig O Conchuir, Charlman, London branch, Celtie League, Policyns Avenue, London E6.

Part-time law degrees Sir,—Mr Bennett (THES, Jidy 15) is undersimulably quick to boast of the rourse which he rous, but his letter in no way dotracts from the point of my erticle.

Broadcasting House, Landon WIA IAA.

nudio-sóded language carrespon

lence runrses recently issued by

Cambridge University the heavies demand was for Scattish Gaelic.

Thosa of intuctiate Irish, Scot-tleh and Weish descent are in fact the blggest element in the nan-English indigenous part of the population. It is shomeful that the potential demand for Celtic studies

Finally, lest use of the word rarialism is deemed to be exaggerated a simple question can be josed. If there were a department of, say, African or Orientol studies in either

African or Orientol stodies in ether Liverpool or any other English university, would it be in ony danger of rlesure, however small the demand? Any sorh inclination would be promptly stifled for fear that die rlesure would be ilescribed as

sldes, as set out, leads to the consideration that raclelism has another espect: cultural recialism.

What should be a respected if small segment of "British" culture is outrageously neglected by the university eatherlies and the University Graots Committee, The ready excuse that the demand is wa. strong support among formers for greater links

Letters for publication should be Tuesday morning at the They should be as short as pe will the civil be as short in the will the civil or reserves the the

work and study and for wich course principle.

Yours faithfully,

Sir, --May I comment on your to pure of the Middlesex Polytecha, "no confidence in the directories' issue 1THES, July 8). In your of pure of the governing body medic your state that "some" tours leaders approved the decision to per-pone the examinations by pome the examinations by an mouth. The position was that t earlers concerned opposed the des

It is now difficult to find now willing to take the blane or dis-the credit for the decision. In director claims he acted on the st adult education it has rarely been wice of the deputy director and the academic registrar. The discretion may says be was first and the academic registrar says gave his advice after consuling the Conneil for National Actors Finally, what of the school broadcasting project You and Me? twer a rhird of the 22,000 schools with young children use these programmes. It is a resources project designed for children, profers and parents as part of the home and school philosophy. It has integrated television and print material. If it fild not exist, no doubt the world would still go on —a fact which is true of many aspects of national life. But its value os a flexible and economic learning system involving young

sion to coll it was taken to be hours before. The polytechnils a number of direct telephone be-

confidence when at the Jun a meeting and the adjourned meeting and the adjourned meeting the do July 6, 1977, as to quarate. The members at adjourned meeting did agree to the chairman shooth seek to a procedure operator to country. n working party 10 countre

making process of the polyect in both its formal and its into aspects, and to make recommentations as to how to make this resulting as to how to make this resulting the more effective.

(Ipinions may be divided out merits or otherwise of the notal larger manifest but chose does as

merits or otherwise of the notdence motion but there does apto be general agreement that to
are problems with the polyected
management strocture. Then
also strong support for a not
brown its a more decentable
thereign unaking structure.
Yours faithfolly,
tittle SHAW.

Sir,-Question: "How do you

The sharp increase in population growth which thok place, for example, in most European countries fram o period starting in the first holf of the last century until some time after the middle of this continuous con this centory, was due to the fact that death rates declined before hirth rates fell. This led to the ropid increases in takes of selled to the ropid increases in tales of population growth often called

sub-tarul

sobtotal

No idea

(The figures for the day the more developed countries, adday the more developed countries, being Europe, the United States and the Soviet Union, hove more or less reached state of equilibrium between birth ond logh rates, while most of the less developed countries are still unfortunately by subject though is not the all-imthe girls were exactly the These results are from part survey corried out by one of colleagues. Keith Stooder of Mathematics and Statistics and Statistic and lend sopport to the fi the Aylesbury Granmar survey (THES, Joly 15) the

by subject, though, is not the all-im-logenit one of population growth, but the the with which we are confronted when als has been solved. The new problem wises from the change in the age structrease in the population, mainly the in-trease in the proportion of older to ounger age groups, and this encompasof course, the problem of aging.

Social concern and biological advances

The growing pains of

growing old

Aging has, I am sure, heen a problem

for human society since tinte intuemorial.

changes and what are some of the major

The classical and still very serious

population problem is that of growth. This was first considered by Malthus in

his essay "On the principle of pupulation" just under 200 years ago. He

pointed out that if a population increases at a geometric rate but its resources only

increase at an arithmetic rate, resources

will not keep up with the population increase. In Molthus's words, this neust

result in " misery and vice for mankind ".

"the demographic tronsition".

Death rates declined largely es a result

at availability of hirth control, or as

Millius put ii, on the dissociation procreation only lie passion

by Walter Bodmer

problems ?

As the hirth rate declines to match population, namely the proportions people at different ogos, elters. beally speaking, the chonge is from a



The British Association

FOR THE ADVANCEMENT OF SCIENCE

situation where there ore many young oud relatively few old people, to a situation where the proportion of people at different ages from young to old stays much the same except for the very old. t improved hygiene, nutrition and medi-ed care, The decline in birth rates, on much the some, except for the very old. In the consus of 1901, for example, about 1.3 per cant of the population was aged. 75 and over, while now this proportion is eother hand, has depended on complex stations hetween social factors and more than 5 per cent, a more than three-fold increase. This proportion is, how-

nortion of the population who ore over 65, about 14 per cent, will change very little over the next 20 to 30 years.

The numbers of the very old, easy those over 85, will howaver, continue to grow from the present 448,000 to an expected and that is an increase of nearly 50 percent. This change lorgely reflects our better ability to look after the health of old people and though the proportion of ever, not expected to increase to mora than obout 6 ner cent, and this in less than 10 years. Similarly, the present pro-

Lady Jean Medawar: Choices posed | Alan Charig: Controversy on origin by scientific advance—II

J. A. Pope: Where are the engineers coming from ?--- III

Interview: Professor Andrew Huxley, president of the BA-IV

F. J. P. Clarke: Energy alternatives —JV

of birds---VI

W. T. Singleton | Consequences and theories of human error-VI

J. G. Hawkes: Problem of plant genetic conservation—VIII

British Association news-VIII Witness of the state of

Sir Ienau Maddock, CB. OBE. FRS, becomes secretary of the British Association for the Advaneement of Science in succes-

No 4, July 22, 1977

vaneement of Science in succession to Dr Megnus Pyke on September 7, after the BA's control weeting at Asian University. Sir leuon, until recently Chief Scientist of the Deportment of Industry, studied at the University of Wales. He had a distinguished career in government service, in cureer in government service, in-eluding the assiston directorship of the Atomic Wenpans Research Establishment, onli was controller of industrial technology at the Ministry of Technology. In 1975 he was president of the BA's Gen-erel Section (X).

siderable resources for adequate health and social care.

The major effect of nchleving a stoble situation with a low birth rate ond o low death rate, os all populations must evantually do, is, therefore, to have a completely changed age structure in the population.

Herein lies the neo-Melinusian prob-lem, which includes that of oging and which we are only just beginning to face. which we ere only just beginning to face. Among the many major consequences are the much greater resources needed to cope with the health core of the older population, the relative reduction in the proportion of the population of school age, an inevitable change in patterns of consomption of all sorts of manufactured and other goods as tastes vary with age, nml, perhaps most important. with age, and, perhaps most important, the used to revise rudically nor ideas mbout pensions and relicement policy and more generally the job structure of our

The British Association, having for many years ployed a major role in the communication of science to other aclentists and to the public, has become increosingly awars of the role it can play in contributing to the discussion of the social consequences of important scientific edvances. For the last few years I have been clulranon of a committee of the British Association, called "The Committee for Social Cancern and Biological Advances". Its role is to bring together scientists and non-scientists to help oppreciate the social consequences of scientific clate the sociol consequences of scientific advances.

Aging is certainly o major issue of our time, and one which has its origins moinly in scientific advences, and so it is to the problem of eging that our comis to the problem of egling that our committee hes devoted its ottention over the post two or more years. Through this activity I have come to eppreciate the tremendous importance of the problem of aging ond the changed age structure of our society. The views I express in this article come from the opportunities I have liadite listen to the mony experts in tha field who have so willingly given this for our octivities. thme for our octivities.

The accial and medical problems of the The aocial and medical problems of the oged are enormous and by no means adequetely appreciated. In this country almost 50 per cent of general medical and psychilatric hospital beds are occupied by people agod 65 and over. Of the aged at home 10 per cent are severely or appraciably handicapped, and in spite of our health service nearly 30 per cent hove not seen a doctor for three months. hove not seen a dactor for three months. Some 20 per cent of health and porsonal sorie 20 per cent of haalth and porsonal sociol service costs ere devoted to the over 75s, who constituta just 5 per cent to 6 per cent of the population. A high proportion of those who are noor ore old, because, at least so far, it has been bard for pensions to keep up with inflation. Many of the old ere eingle, mostly women who are widewed elngle, mostly women who ere widowed or (livorced. The ratio of womon to men over 75 is about two to one and as the birth rote decrenses, an increasing proportion of these, by now certainly more than 25 per cent, have no children

continued on poge II



Frant page f

who can assist them in times of need. There are many clearly defined approaches which could nt least alleviate the difficulties of health care for the seed. Services for the elderly should be community based, since mast older people like to remain in their own bonies for as long as nossible. The usual self-reporting of illness by the patient to the doctor thes not work adequately for elderly neaple. An effort has to be made to seek out illness in the elderly through regular visits from health visitors, Irained voluntuers and doctors, who should be part of a health cure team for alder people.

Older people nearly always suffer from a mixture or diseases and may incretore present unusual symptomis for otherwise readily identified diseases. When these that it must be flexible. Not everyone will want to retice at the same age or irrented and much suffering can be allowed. a mixture of diseases and may therefore present unusual symptoms for otherwise viated. Last and by no means least in this list is the need to increase the status and respectability of the geriatric prac-

medical ones and include, in partirular, electines with increasing age, and this the question of what is the best retirement policy. The problem of what to do about retirement nges and retirement policy hos become much greater as the proportion of older people in the population has increased. There is now o relatively large number of people who may be left with another 10 or 20 years of physically and mentally active life after their formal retirement at the age of 60 that can be a continuing occupation to or 65. Is it right still to think in terms arevent that sudden brook with the rest of o given occupation to a set age of 60 or 65 then a sudden stop? What should be done about that strange inequality between the sexes which leaves the retirement oge for men, for ponsions under the Insurance Act, ot 65 years but only 60 veors for women? The natural direction in which to remove this inequality might appear to be to reduce the retirement age for men from 65 to 60. Perhops, it is even said, this might help the unemploy-ment problem o little although of course the change would cost o lot of money. But is it really right to think of reducing the overoll age of retirement like this?

Soma months ago the cost miners arguent for n phased reduction in their retirement age, evolutedly down to 55, and largely achieved this olin through the threat of industrial action. I can woll imagine that n miner nt the coal face feels more than ready for retirement at the aga of 55. But is this to be just retirement from the coal face to the surface, or complete retirement from regular, full

Almost every day one hears of the retirement of some leader of Industry. One day it may be the chairman of Rughy-Portland cement, who retired at the age of 78, while the directors of ICI, it seems, have to go at the age of 60. Church of England bishops must retire when they sre 70, while university teachers do so at the oge of 67. If, on the other hand, you do research for one of the research councils instead of the university you

may, or may have to, retire at 60. I doubt whether this miscellaneous cal-

lection of ages has in each case been carefully worked out to suit the occupation, and suspect that the choice of retirement ages is a fairly arbitrary and haphszard business dominated by current practice, which has undoubtedly changed with time. At the leginning of the century, official old age was certainly older than It is now. Surely, thought must be given to change in our retirement updaying to changes in our retirement policy and to praviding mure apportunities for a continuing occupation, at least part-time, continuing occupation, at least part-time, for those who wish it and who are over 60 by Jean Medawar

What should be the hasls for a change in retirement policy and, more generally, for a change in our job structure? Per-

The next important point must be that more opportunities should be created to their johs, perhaps in late middle age and in any case before the usual retireage structure are at least as augent as the ment age. The ability to learn new skills must be taken into account.

The third important principle must be that greater opportunity should be proviiled for people to continue working, nt same job nor nue with anything like the same responsibility, but just something society that can su often occur on retiremeut.

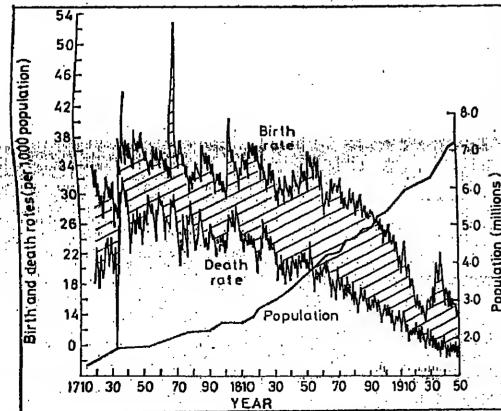
A major problem in retirement is, of cnurse, money. Providing adequate pensions is a very expensive business, which olveady costs n grent deal more than thn whole of the health service and which becomes increasingly expeasive the mare adequate the pensions and the lower the retirement nge. Especially in those times of linoncial restroint and constant, if not declining, amounts of maney for the sucial and medical services, a choice has eventually to be made between achieving lower retirement ages and having more

odequate pensions. Perhaps those who wish to retire early. hut as a result have lower pensions, should be able to da so, while those who perfer to gn an working anyway, nr wnuld prefer to go on working in order tn have better pensions, can do so if they

I certainly hape that the relatively short-sighted view that reducing the retirement age nilght help solve the un-employment problem will not dominate futuro policies uhout retirement.

We must learn to cope with our ultimate population problem, that of aging and the changed age structure of our society—and to aim for a life that is full and healthy until the moment of death.

The author is professor of genetics at Oxford University and chnirnum of the BA study group on social concern and biological advances.



The demographic transition in Sweden. As birth rates declined before death rates population size increased sharply and the start of the

Science and quality of life

The choice is sometimes what not to do

It is sufe to guess that this tnuic—the effect of science on the quality of life was chosen as part of the feeling that humans are nearing the end of the millennia during which they came to believe that they were the ton of created form, and in control of the rest of the school below them.

In the past 100 years the human world has changed faster and further than in uny millennium hefore. The list of scientific discoveries and their application by problem is replaced by subtler and before technology starts with the combustion en-gine and its broad of trains, curs, aero-power knowledge has delivered? by planes and Concarde, and goes, ria Pas-teur and bscteris, anaestheties, birth control und instant global communication in technology? What quality of the stomic energy and recombinant DNA, All sacred? this is too much to contemplate, let alone xperience.

The story of the changes braught about hy knuwledge has been told before : Atlum and Eve gut on all right until they last the quality called ignarance by some and innocence by others, and Pandora was all right too until she opened the hox. What none of the familiar myths and stories told was how to munage, once Eve had oheyed the scrpeat and Pandora her curi-

The changes are crowded most thickly into the pust 50 years, and 50 years on from the days of schoolrnom texts, lnw, rundling questions about knowledge and quality of life are being asked and sometimes groundless fears are fauned by and grow up to have children of some of the answers.
The biggest questions enneern the man-

gement of a halance hotween the wealth of the world, stared in ail, craps, water the contary have been replaced by o and minerals, the numbers wanting and needing the wealth, the size of their demands, and the disparity between those three times the rate of population growth who have a hope of attulament and those and population is expected to deep who have not. Perhans the answers are who have not. Perhaps the answers are in 30 years. Sanguine prople think only guesses and perhaps even the ques- will think of something ", pessimists he tions are wrong; but both show that the species that ance thought its members waste resources and seek to meet the were Lords af Creatinn is beginning in consider if and why they are.

Are the Lurds paying enough attention to the cyclical nature of their support systems? In what direction is the mass of knawledge sweeping them? Up tn heights from which an Ignominious clattering down is inevitable, or to a view which reveals some of the natural arder of which we, in common with the nut and the elephant, are subjects, and to which we, however smart wa are, are also sub-

arendlag of the words and so avaids gol- solution. Drop the two-edged with on with the problems which the progress made possible by scientific and solution. words outline.

lng the taoic, Elizabeth Sidney finally thought fit? We might anyway satisfied oil members by proonsing that selves some hopeful confidents the common decomposition of the common decomposition decom the common denominator of ideas nimut quality of life was the degree of tension or halance between what a life-style currently was and what it might become. In order to have any quality, this tension has to exist, whether you are in hed boping to recover from an operation, in a despot's iail honing for liberation, counting your first million and nlonning for a second, or are in the Kslahsri desert with the knowledge that life-glving melons oro

omewhere heer. When the distraction over definitions is ut of the way, it is possible to start balancing up the beaefits and penalties of science and technology, and very interesting they are, both in prospect and retrospect, which as P. G. Wadehouse

BRITISH ASSOCIATION 2006 nnce remarked, gets rosier and rosier the more retro it becomes.

The five main areas in which the know ledge revealed by science has most ob-viously affected the quality of life in the past 100 years are health, domestic life, energy, communications and u ality.

The influence on health is perhaps the

biggest, and on morality the clost la-reaching. The knowledge used by Chet wick, when he controlled a typhoid ep demic by chaining up the parish pump to cut off the main bacterial supply, saved millions of lives at the time and there after. What has been called a decided preference for staying alive herame available to those who previously had no chaice.

The applications of scientific research in health are so cutwloed that it is quicke to list the visible ends of the thread than tu disentangle the whole ball; anais thetirs, asepsis, X-rays, antibiotics, till mins, contraception and refrigeration make up a hattery of defences against the old enemy.

The new replacement enemy is soil iar: as usual, the soluble and technic now has judgment over life and bat? What are the wisest ways of using the

Such questions are not soluble by science or technology, and apan has a skeleron of ugreed medical definition about death, they are solved, not by tele ence tu any general rule but by weights each particular case, balancing the bette quality of life gained by scientific & rance against the penalties to be paids.
It. This is valid far life in a hearing machine, for chousing frozen spins rather than washing homegrown from garden or for lutalling inboursaid machinery which puts aren out al sor

The effects of science on domestic have been revolutionary. The war clean and the drains are main. The me awn. Their mothers can choose her use their talents. The million dome serrums working in London at the top aric slaves.

Demands for energy are growing "they wun't " and the realists try foll demands by exploring different ways using natural and orthodox sources

energy.

Since we learnt how to split atoms in meash foldinating energy, the more included as the investigating team of all has appeared. We rest in Barbara Ward's words, that we go in portant aspect is the real commany are willing to agree that the fund disrepute but olso engineering (since by Apart from the train service between the good into they are considered akin). It cambridge and Landon, every set of the constant of the constant in universities by trying to make the constant of technological skill; and the constant of technological skill; and the constant of the constant of the questions which have struck has proceeded with its work. One important aspect is the real commercial danger of confusing engineering with scientific effort. This communication goes faster and farble that old investigating team of the proceeded with its work.

Cambridge and Landon, cvery set is set of the constant aspect is the real commercial danger of confusing engineering discount of the proceeded with its work.

One important aspect is the real commercial danger of confusing engineering discount of the confusion of the proceeded with its work.

One important aspect is the real commercial danger of confusing engineering discount of the proceeded with its work.

One important aspect is the real commercial danger of confusing team of the set of the proceeded with its work.

One important aspect is the real commercial danger of confusing team of the set of the proceeded with its work.

One important aspect is the real commercial danger of confusing team of the set of the set of the proceeded with its work.

One important aspect is the investigation of the set of the proceeded with its work.

One important aspect is the investigation of the set of the proceeded with its work.

One imp

In the working armin currently discussions the troic, Elizabeth Sidney finally thought a new possible by try gratefully the use one edge and try gratefully the use one edge and the use of Sword has reduced infant morta ninved plogues, pain and smallpo

At least we are heginning to wars:—an scientific or technole is alone going to improve the life. Quality still begins with much choice can be made b The festest way to improve, life is to choose more wisely and sometimes to choose not t science hus given us the power would Perhaps then the power. some genuine glory.

Ludy Meduwar is director of the bi Pyke Memorial Trust, and co-ord the BA's study group on science for BRITISH ASSOCIATION TO A CONTROL OF THE PROPERTY OF THE PROPER

Where are coming from?

by J. A. Pope

It is now generally necepted that if the health of the economy is to be improved, then the health of manufacturing Industry must also be improved. I do not want to join in those who constantly decry industrial performance, indeed as a nation we do this so often that it may professional engineers and on quality, wo standing in world trade as well as u disincentive for more able young people to choose industry as a career. The truth

grow, that our competitor countries must current rate of university and CNAA have their own success in world markets, gradunic output is giving professional particular technologies to change hands.
I think the gut feeling of many who ore
concerned about the future is that we seem to be losing our leadership to too many areas and gaining the lead in ton

It is for reasons such as these that the British Association, with the support of the Royal Society, government departments, professional bodies, educational supported by an investigating ream of the University of Aston in Birmingham, with the following terms of reference -To investigate what steps are desirable, with respect to the education (including career advice), recruitment and employment of professional level engineers, to improve the performance of British manufactoring ludustry and in particular the effectiveness of production management.

The report will be available at the 1977 BA meeting and public discussions on the report will be held at the university on Monday and Tuesday, September 5 and 6 respectively.

The purpose of this article is to pase some of the questions which have struck

at nationally and as a result triain nationally and as a result. In the table columns (4) and (7) show, and designed therefore may not give a true performance of university graduates classified according to subject groups. one would have to say that a sufnamber of engineers is being at the proposition that the producing about the right score of 5 points or below (column ersistent overall shortage of engl-

r salaries relotive in others (prior There is evidence of some yers who do complain about short the higher scores. en do so in the form "we interUniversity engineering students

Subject Subj	7.2 53.7% 9.1% 19.9% 35.6% 6.4% 35.6% 6.8 75.1% 11.0% 22.0% 31.0% 7.4 46.6% 3.4% 6.8% 26.6% 11.0 50.2% 6.1% 14.2% 23.0% 14.2%
--	---

hal view must be tempered in three ways; first, in the focusing on to choose industry as a career. The truth is that manufacturing industry ulready achieves a great deal, but in world terms the challenge it faces requires an even greater effort.

In 1960s, the rise in graduate output, was achieved without initially diminishing the flow of lighter National Certificate (Diploma men; in the 1970s the HNC/HND numbers gaing on to professional status has fallen to almost zero. The current rate of university and CNAA Input little different from the degree plus eertificate/diploma input 15 years ago.

Secondly, even if total numbers are adequate, the lightness by individual discipline is rarely right. Students choose their disciplines during their last years of school—their graduating three or foor school-their gradunting three or foor years lster may necur in entirely different economic circumstances.

This lends to the third main point. Folorganizations and industry, formed the British Association Co-ordinating Group and set up o special working party supported by an investigating team of clino in university graduate output in 1976-77-78 is currently governing indus-try's perception of shortage. Applications and admissions rose in 1975 and again in 1976 and all the signs are for a further substantial rise in 1977. We have to assess whether these clr-

cumstances are sufficient to satisfy demand in 1979 and onwards. The dunger, if we go for yet further quantity is that we may miss an opportunity in raise average quality, produce a surplus in numbers compared with industry's requirenent and find that the surplus is rejected by industry on grounds that it is of lundequiste quality. Clearly this is a complex problem and one that defeated the manual power planners all through the 1960s.

Should there be a further contraction of industrial activity there may well be a surplus of nualified engineers. But if the object of the planning is to plan for success, this means that we plan far su

In the light of such easy mustless, the topic chosen by the British Association shows up more clearly; it is an uttempt to discover the extent to which lives have been improved or snoided by the discover the extent to which lives have coveries af science ond technology during the past century. The effects have chonged the quality of many lives nut all recognition. Knowledge has aiven nower—now what about the beginning of wisdom?

The phrasa "quality of life" acts as a long and the consume cullessy with the montal of technology knows what it means, but nearly everyhody knows with the montal of the montal of the consume cullessy and the montal of the consume cullessy and the montal of the consume cullessy and the montal of the future he short of the future he be drawn quantitative analysis is not

is escentially about the right quantities, then it will be seen that there is n high percentage of engiacers with this low score—21.7 per cent, which is nearly would be expected to yield a rise twice as lurge as the percentage of students in that group—12,7 per cent (column two). nlso, when one looks at diployment although engineering engineering lt is low at 8.6 per cent whila for science it is slightly higher of 9.2 per length other disciplines. Thuse cent, Languages, arts and medicine have

second at 9.1 per cent. Culumn seven shows the proportion of applicants luck mainly at university graduates since this is the source from which future top applicants are accepted, which represents the 1960s, the rise in graduate output.
was achieved without initially diminish.
Thus, it would seem that if one anticipation pated increasing the size of the engineering pool by transfer from the science pool then there is little indication that the averuge standard of engineering would

This begs the question why industry complains of the munity of engineers produced. May unt the answer be that industry is the main source of employment of engineers, it has both the best and the less able, while from other disciplines it employs only a small percentage of those gruduating, and can therefore he very selective and meet its need by only selecting the hest.

On the other hand if industry cannot use effectively the majority of engineers the universities prudoce we have a problem, because in spite of everything, thuse studying engineering still represent a selection from the top 10 nr 12 per cent of the population. This being the case it can only mean that either the degree courses as constructed are not an effective way to train engineers on that they can develop lo an industrial environment, or, alternatively, industry hos obdicated from the responsibility of training on the job which enables graduates to be effec-tively employed and absorbed into the

I guess it is a combination of both and that the universities and inclustry have a common problem which requires the close cooperation and a common spproach fram both sides in order to rench a solution.

This is an orea where a completely new initiative is hadly needed and one which can only be effectively undertaken if it is clearly realized by both sides, that, engineering is primarily "an art" and unt a science. The renction of some to the expansion of the industrial activity of that the standard of admission to that the nation | If this is the case then there is little doubt that if the present pattern which would improve the average quality of the trained engineer. This is probably true, but the correlation between A-level performance and the quality of the degree obtained is not good.

For example, at the University of Aston an anolysis was made of what increase of admission standsrd would be needed to demanded is an increase in the number of high calibre englosers rother than a simple straightforward increase in rum, bers. This is also a very complex problem and further investigation is necessary before one can talk in hard fucts. Thus what follows is primarily personal judg-

Thus by rsising the lowest admissing attainments accepted from, say two A-levals at grode D, ie a score of four for engineeriog, to say two A-levels nt grade C (a score of six) this would undoubtedly raise the averaga level but would also likely reduce the total number of good engineers qualifying.

The only way to obtoin an increase in the only way to caron an increase in the numbers of the more uble engineere is to encourage more people to apply to take engineering, which would enable the entrance standard to be roised slightly but could increase significantly the notember of could increase significantly the potential number of good eugineera,

The greotest effect would be to find

rigid demands of nominated A levels in order to apply for admission to university engineering departments.

For example, admission requirements invariably demand two commuted A levels, such as maths und physics. The construior on applicants would not be caused by demanding three A levels or by demanding a reasonably good performnice in two. The problem is caused by nominating two specified subjects which do not in all cases mutch up precisely with the sixth form pattern existing in the schnnls.

For example, in England and Wales 37,000 girls and 47,000 buys left school in 1975 with two or more A levels ond in the main It is only the hoys who consider engineering. Moths passes by hoys numbered 34,000 a year (including soma who sit two meths subjects), and physics passes 23,000. Figures for subject combinations are not engished but the suidence untions are unt ovailable but the evidence points in ahnut 15,000 in 20,000 boys a yeur who have muths plus physics.

This is the ponl from which universities seek engineers, but with this combination they could also apply for most branches science and medicine. Home mule udmissions via IICCA applicants to engineering and technology in 1975 were over 8,000 which is really a very good share of the 15,000 to 20,000 available.

If, however, the entrance requirements for engineering were simply stated as o minimum of five O levels which included maths, physics and chemistry, and two good A levels, of which ane tunst bo mothematics (and not specify sny other subject), and each candidate was interviewed to assess motivation and calibre, then the number of school leavers who could consider engineering want in-croase from sny 18,000 to 30,000.

This simple modification requires no change in the schools, no change in Industry, just a change in the stated adulission requirements by engineering departments; the modification is cam-pletely in the hands of each university and the change could be made at no expense in a matter of months.

Any other passible change would take years to become effective, if, for example, schools and school leavers became more attracted to an industrial career then with present entrance requirements that swhich would have to be made at the commencement of the A-level studies—at 16 years of age—and it would be a minhuum of two years to be effective at university level, and only then if the change of subjects at slath forms constant as a telling jects at slath forms created no staffing problems in schools, which, of course, must likely it would.

With this more open entry requirement it is right to ask the question, would the university be lawering standords? It is the calibre of person one is looking for and if the candidote is of good intellectual calibre, is strong in mathematics and bos the correct motivation (hence the luportonce of luterylewing each condidate). I can see nothing but odvantage in the change. In fuct it would assist the universitles to produce in engineering the hroadly based courses of high standing for which industry is asking.

Dr Pope is vice-chancellor of Asion University in Birmingham and general treasurer of the BA. He is vice-chairman of the co-ordinating group and project director of the BA's inquiry into education, engineers and the mininfocturing liquistry.

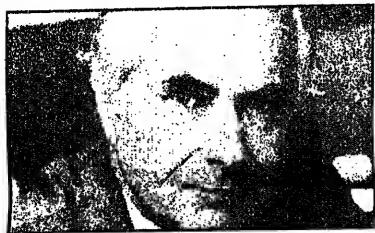
PENSIONERS AND PROFESSORS : AN AFTERNOON DIALOGUE roa often there is an unaeceptsble gap

in communication between the people who make social policy decisions and thuse whose lives are directly affected by theu—the "planners and the planned".

The British Association for the Advancement of Science and Age Coucern Eng-Jand have orranged for a group of about 150 old age pensioners to meet in a friendly confrontation with the planners. leatling academics and administrators. On the plotform, explaining their wock and answering questions, will be specialista concerned with health, pensions, food and diet, design of everyday things, and herealthy among other tenter. The particular heredity, among other topics. The participating audience will consist of ponsioners, means of effectively opening up that engineering profession to women. This again is a matter of spiles resistance and any great change would be difficult to

BRITISH ASSOCIATION

David Dickson interviews Professor Sir Andrew Huxley, the BA president





Two BA presidents in one family: Sir Andrew (left) and his grandfuther, Thomas Huxley.

With the imminent depurture of its ener getic secretary, Dr Mignus Pyke, the British Association lins in recent months heen plunged into a fresh round of deliberations about its future direction. These deliberations have meant that the current president, Professor Sir Andrew Huxley, F.R.S., has been more directly involved in the BA's affairs than some of his predecessors.

Until a few years ago the president was untomatically chairman of the council", says Professor Huxley, who is Royal Society research professor of physiology nt University College Landon, and was awarded a share of the Nobel Prize for physiology of medicine in 1963. "This was not a very satisfactory arrangement, as presidents are not selected for their abilities as chairmen but hecause it is thought they are likely to produce an interesting oldress."

The result was that when Dr Pyke joined as Secretary in 1973 he was also appointed chairman uf the council; with his departure the two roles are once again to he split, and the new chairman will also chair the meetings of the associa-tion's "colley committee". Meanwhile, Professor Huxley has been acting as chair-

man of the latter body.

Future changes are likely to be more than merely administrative, and will corry on from developments that have been introduced in recont years. One of the most significant of these has been work for young neople, notably the establishment of British Association Yuung

Scientists (BAYS) in 1968.

Through this body, which now has sbout 10,000 members in schools throughont the country, and through science fairs, lectures and other activities ron by local branches, the association has done much to counter the swing from science that seemed so alorming o decade ngo", Professor Huxley says. "Another important development has been the establishment of study groups, which have produced books or pamphlets on topics where science has a direct impact on society. They were suggested by a cammittee of review set up in 1970 to look into the BA's own activities and to suggest new directions in which it might go.

'Its report also contnined a number of other valuable suggestions which have not ver been fully acted on, oud during the past year we have been taking a fresh look at what the BA is doing and looking again at the report to see whether more of its recommendations should be acted

Throughout its existence, however, the BA's main activity has been its annual, not produce the detailed evidence until meeting, which (except for war years) later.

has taken place regularly sinca 1831. But it is certainly true that the main Initially this was held primarily for the point at Issue during the whole of the evohenefit of active scientists, providing a lution controversy was out so much the forum where they could present their question whether man evolved from some research results and meet fellow scient sort of spe but what was the nature of the tists, but as these functions were gradu. grounds on which an idea of this klod ally taken over by specialist accieties the ought to be accepted or rejected. Should role shifted to the equally important one,

very important function. Over the past few years, however, it accurs to have bean lorgely token over by television programates like Horizon, with an oudience

has been falling over the past few years. Another reason is the increasing cost of rent issue has come but lots the open. Whether the BA will wish to set up a millions tons of coal a year increasing have been very body treated. Darwin sat collecting and marshalling his seed, a seed of the open of the open of the coal a year increasing the equivalent ples—perhaps the equivalent ples perhaps the equivalent

Keeping pace with science and change

financially. The number who can afford o full week of being looked after in a university hall of residence at their owa expense is becoming smaller and smaller. This is the type of thing that is putting the

anoual meeting in danger." One alternative, Professor Huxley suggests, is to extend the open discussions which have been a feature of recent anmuol meetings. In them a discussion takes place between a number of specialists on some topic in which there is strong pub-

At the Aston meeting there will be une an the education, recruitment and deploy-ment of professional-level engineers, the culmination of an Investigation carried and by the association, financed partly by

"An open meeting of this type where people can beer a case argued of length between different protigonists, and can actually take part in the discussion themselves, is something that cannot be done aa aaything like the sume scale on television or rudio. It is much more extensive, for example, thun the Controversy programmes un the BBC."

One of the characteristics of the BA is that, as scientific orguments have shifted to specially societies nod juncuals, the aroin debates in which it has been tovolved have concerned the social aspects of science. "I think that it is right that this is so, as debutes an the content of science involve a much more specialized group of people than the BA would expect o he able to gather together", Professor Huxley says.

Even the great deligies that took place at the association's meetings in the nineteenth century were largely over the in-terpretation of scientific discoveries rather than the discoveries themselves. There were, of course, also disagreements shout data. In the dehate on evolution at the BA meeting at Oxford in 1860, one scientist put forward the claim that the human brain contains certain structures not present in the broins of the great apes, for exomple, and this was immediately denied by my granufather, Thomas H. Huxley, at the meeting, although he slid

It be based on scientific cyldance, on outhof presenting the advances of science to orlty, or on feor of what the consequences the general public.

Yet even this, Professor Huxley feels, has its limitations. "It is cortainly a tha implications of science for social and philosophical Issues hut also the danger of social and philosophical lileos reacting

back on science and stultfying it." Professor Huxley sees a clear parsilel of millons, keep the public informed between the arguments that took ploce obout science on a scale which connot be matched by a single meeting ottended by, at must, a few thousand peoplo.

"This is prohably one of the reosons that attendance at the annual meetings has been falling over the arguments that took ploce over the arguments that took ploce over the arguments that took ploce of the arguments that took ploce of the arguments that took ploce over the arguments that took ploce of the arguments that took ploce over the arguments that the arguments that the argumen

"One major diffarence is that the cur- porary science."

evidence for 20 years before the famous letter from Alfred Russell Wallace forced him to write The Origin of Species, which pretty well flattened opposition in a short

"If his ideas had come out at a time when they were tentative and still hypothetical then they might well have been squashed by apposition based partly on the authority of the Bible and partly on fear of the consequences for human ethics f ernlution was accepted."

Professor Huxley feels that the current debute an the relationship between genetic factors and intellectual abilities is very much the type of thing with which the BA might concern itself, approaching the issue from a number of directions. "Firstly there is the straightforward question of the extent to which there are oupholes in the existing evidence; but I think that it is also Important to look at the broader consequences of the issue.

"Far example, we now have the extra-ardinary situation that anyone who is hold enough to indicate that he thinks there is evidence to support claims of a relationship between generic factors and intellectual achievement is immediately denounced as a fuscist and a rucist.

"This might be a legitimate uttack on a person who stated, on the grounds of such evidence, that samo kind of pollrical action should be taken ugninst people of a lower ability, has I think there are very few neonle-in this country at any ratewho would argue that a group who have lower scores on certain types of tests should be further penalized; mast people wind take exactly the opposite view, and would favour policies that would tend to compensate for the reduced chances of success in our competitive society.

The ethical question is not related to whether one believes that there are hereditory differences in intellectual ability. Rother It is a question of what pulitical uction one thinks should be taken, given certain scientific evidence."

Professor Huxley sees a close purullel between the strong emotions raised by this issue and those roised by the nine-teenth-century evolution debate. "At that time people felt the suggestion that we were descended from monkeys was attacklng tha dignity of man, just as they now feel that the dignity of a fornily or of a population is being attacked by the suggestion that it is loss fortunated in the gestion that it is less fortunate in the

inheritance of some type of ability".

And what ore the lessons of the nineteenth-century ilchate? "That It is vital that the scientific arguments are decided It is essential that a debote on o question of fact should not be distorted by arguments the solar energy scene, useful and by figure of the order o ased elthor on authority or on fear of energy can be provided by

the consequences." Another very different tonic that Professor Huxley feels might generate powerful emotions is the whole field of extrasansory nercention and nuranormal phenomena. "If someone started putting witchcroft, for exomple, on o scientific basis, that would certainly stir things up in the way that the race and Intelligence issue has, but no one has yet got far enough for the public to take it seri-

ously", he soys.
"This is a field in which almost nothing is firmly established, but I do not think that one can dismiss all the phenomena, partly hecause some of them appear to be well established and partly because as things along the partly favourably resolved, solar energy favourably resolved. because, as things stand at prosent, riding ilonestic hot water counting number consciousness lies outside the petted to be widely lastabled and lastabl range of onything connected with contem-

Question mark over energy alternatives

F. J. P. Clarke

Among the alternatives to oil and gas, sources of energy are san, wind, was, tides, and geothermal heating. Eur fur waves, the energy of these sources already being used in various controls. The questions for us in the United Kingdom are: How large a contibute is each likely to make? How soon? An they likely to be comonic?

A major prublem in harnessing then is that they are diffuse forms of their compared with fossil fuels or such fuels which can provide 50,000 but M square metre at the heat-exchange faces. By ennirast, the sun itell rarely exceeds 750 waits per square oud the anoual daytime averageand 200 wars per square metre.

Nature provides some concentations the sun's energy in wind and was la thermal gradients in the atmosphere to ing indirectly from solar radiation to some of its energy into the movement large masses of nir, whose mones provides an annual average of pate 400 watts per square metre of winders over the coastal regions.

The wind in turn whips up the and in the sea and where it has a let ennigh fetch of water f100 miles as the energy of the waves provide 162 centration of 1,000 watts per squared uver the first several metres determined water. In their natural form also energy sources are a long way offer tensive energy suurces from white economy has been developed.

The sun

The sun's rays may be focused white ur concave mireor. An energy de comparable to that achievable with fuels can be reached in this way less to solar fornaces and hollers. Elect power stations bused on this approach States, the Soviet Union, and the Hawever, the HK is too cloudy for the he economic. We have in rely on his ened flat-place cullectors absorbing focused sunlight. Water circulating in such collectors

be heated to say 75 degrees centia before being circulated to host exchi ers in hot water tanks. Higher water is peratures can be reached, but the diector then loses orore heat and become less efficient. Hence, solur energy in IIK is restricted in providing rather to grade heat, not suitable for electricity po duction.

Apurt from our cloudy climate, Apart from our cloudy climate hasic problem of solar energy in the is that we have most of it in the summarism when we use the least fuel. This unlike the situation in the United Said where a great deal of energy is used a summer time for air-conditioning it plate solar collectors can therefor have deal of many in the plate solar collectors can therefor have deal of many absorption type air and to many absorption type air and the many collectors. in winter time. This all season of the installation Improves both the

lectors suitably angled towards A large area of such collectors of ville an oppreciable amount of let a

even during the winter months. Ilowever, there is o tradeoff b the cupital cost of the system amount of hot water required by large a system may give ao exc wuter in the summer time, where small a system will have to bear a fixed capital charge for the heat pro

Until extensive independent has been completed, there must The energy usage for domest

BRITISH ASSOCIATION hearing is over three times that for domes diameter (probably accessible no existing

tic water heating, or just under 2th per technology) would lead to a machine of con of our total primary energy demand about I megawatt rating. Since the effi-1325 million tons of can't equivalent in ciency of electromechanical machines falls 1976). Total space heating, excluding off rapidly if they are not run close in 1976). Total space neating, excluding industrial use, probably exceeds 30 per cent of primary energy demand. So, if the sun could be used to their rated power output, one has to seek sites whose wind climate is appropriate to the rating—which means the windiest convert this relative mution into a primary energy demand. national space heating demand, a very real national energy saving would occure. This is the real lure of solar energy.

The sao's heat can be stored for use in wioter quite siouply in very well in-sulated stores of water. For a typicol three-bedroumed house of 200 cubic metres, a woter store volume of around 100 cable metres would be required to hold the heat from summer to winter.

At present this is not an attractive economic proposition, though it is technically simple to achieve. There would be a big potential reward for anyone who could come up with a chean compact heat store. In the Interim, smuller stares will sill have a role to play in smoothing out sborter term variations in sunshine.

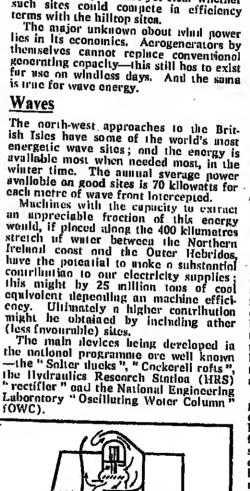
Other merhods of using solur energyby photosynthesis -ure more remate from commercial

Wholmills were widesprend as traditional sources of motive power from the Middle Ages onwards. Then, with the coming of the ladustrial revolution, they were displaced by more convenient and efficient steam engines. During the past 40 years, many attempts have been mode to reimroduce large, modern versions of the windmill. Some of these have failed to mature the to environmental upposi tion. Other large machines have been ball, but have suffered eventually from blade or bearing failures.

These problems coupled with the availability of relatively chean oil and nuclear electricity reduced the incentive to persevere notil very recently. Now, in the rather different perspective of 1977, the use of acrogenerators is being veexamined in several countries, particularly for electricity production.

The energy output from aerngeneraturs depends upon three moin factors: the cube of the wind speed, the total time for which the wind is blowing fluth of which place a great premium un windy sites), and the square of the rotor diameter, which places a premium on deveoping large muchlnes. The cost per kilowalt justalled decreases by a fuctor of 10 io going from a rating of one kilowett to one of 10 megawatts. This, coupled with the fact they many mujor centres of population are in the least windy areas, explains why small local aerogenerators are only economic in special locations remute from power lines.

ever, an upper limit on nuchine size is imposed by materials, particularly roter blade materials. A 50 metres hiade



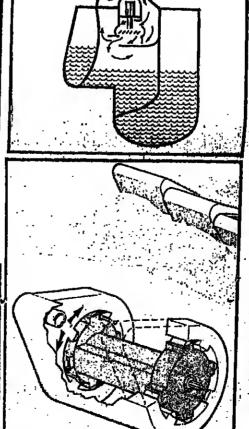
A recent survey of such windy sites on lood concluded that some 10,000 were available. These would sare the equivolent of six million tons of coal per year if used to offload the less efficient power stotions. The areas of these sites ilu not generally coincide with the areas of maximum tlemanil for electricity. They tend lem of optimising the system parameters tops of hills in these oreos. A one megowatt acrogenerator would be about the speeds and same height as s 400 kV electricity pyloa, so there are environmental problems.

The aerogenerotors could be placed out to see where the wind speeds are higher than over the land. The problem here is the increased capital cost of off-shore machines which would have to include machines which would have to include support structures designed for the hostile marine environment. These casts, together with those of getting the power schore, would tend to offset the higher energy untake at sea. Such problems would be alleviated by restricting sites to more sheltered shallow waters, which would still meet the environmental probwould still meet the environmental problem. However, it is not yet clear whether such sites could compete ia efficiency terms with the hilltop sites.

ish Isles have some of the world's most energetic wave sites; and the energy is available most when needed most, in the winter time. The annual sverage nower available on good sites is 70 kilowatts for

streich uf water between the Northern Ireland coost and the Outer Hebridos, have the potential to make a substantial contributian to our electricity supplies; this might by 25 million tops of cool equivolent depending an machine effici-ency. Ultimately a higher contribution might be obtained by including ather (less invourable) sites.

the notional programme ore well known—the "Salter ducks", "Cockerell rofts", the Hydraulics Research Station (HRS) "rectifler" oad the National Engineering Laboratory "Oscilluting Woter Column



he top left clockwise a wave contouring rult; useillating water column, Sulter's iks and the Russell reculfier.

The dock and raft devices are generic- incidentally from the mining areas, which ally similar in that the primary output rumponent (a duck or a raft) relative to identify areas of potential interest. mary energy output from the device.

Any such system will absorb or damp, the relotive motion; and for maximum extraction efficiency this damping occils to be "tuned" to the characteristics of the waves-height, frequency and direction. These characteristics are and extraction efficiency against the wave

Another problem stems from the low speeds and frequency, and readoni amplitudes of the waves. Slow speads oreao big electrical or hydraulic machines, und big machines ore heavy and expensive. These coupled with the other characteriselectric generators : efficient generation requires relatively high, and preferably constant, speeds.

Such problems are by no menns technicolly insuperable. Velocity can be increased with gears. The use of an intercity can satisfactorily smooth out the variabilities in the primary output. But it is clear that these wove energy machines are complicated engineering systems whose economics will depend both on further systematic development as well as on engineering inventiveness.

The HRS rectifier and OWC mechinas are each at on earlier stage of development. But, at this earlier staga, the probalbeit of low speed and very large, con readily be used to convert this licod of water into electricity—though, as with all devices, not directly to the electricity

In this device the problem area cur-Muchines with the capacity to extract an appreciable froction of this energy would, if placed along the 400 kilumetres streich in water between the flops which "rectify" the passage of streich in water between the flops which "rectify" the passage of water into and out of the system.

The OWC compresses air directly lato what is effectively na energy store. This campressed air can then be used to drive a turbine whose inortia may be used as o flywheei, designed to maintain a near constant velocity over a wide range of lunut conditions. But again there will be a complex optimisation problem in that a flywheel of high enough inertio to accommodate calmer sea conditions is likely to be that anich less reaponsive to the more energetic sea stotes from which most energy can be recovered.

The status of the wave energy programme as reviewed here is quito typical of the early stage in a modern technological development. The important point for the future of wave energy is that, in spite of the technical complexities already evident, no really fundamental problem has so far arisan that would imilicate that nature is basically agolast a solution to wave power as a vialila technology.

Geothermal

The heat flow from within the Earth is very diffuse—less than one tenth of a the Severn estuory, watt per square metre. So we connot. Such a resonant condition will be sensi-

There are, nevertheless, a few areas where local faults allow water from the crust to rise to the surfaca; the hot springs at Bath are one example. In other cases, water nt depth is heated to useful temperatures by the normal hackground heatflow. Suth resources may be economically exploitable. The question is —do these sources have enough hot water at an accessible depth to make a useful contribution to our UK energy neads?

Few facts are one example. In ces, we have to remember that a schema that will produce energy in 20 years time cannot solely he judged on today's fuel prices.

The nuthor is research director (energy) of the United Kingdom Atomic Energy Authority. He will be addressing the physics section (section A), on Tuesday.

Soptember 6, springs at Bath are one example.

may por be hest from the genthermal comes from the random motion of one viewpuint. Nevertheless it is possible to

His water deposits are moinly located within permeable rock in the sedimen-ury basins—of which the Hampshire basin is one of the more promising. Recent resurts from a Dorset borchole drilled with Department of Energy func-ing pointed to the existence of a saltwater aquifer over 80 degrees centigratie at 2.5 kilometres depth. This is very promising. Such a temperature could certainly be appropriate for a district heating scheme, though not for electricity generation. The exploitation of such reserves will depend on whether a local demand exists.

There is in fact experience of using such heat in France where thousands of dwellings are already belog heated in this way. If the early promise in the UK is established, it should be well within our tech-These coupled with the other characteristics provide practical problems in driving cynivalent to o few millions of toos of can per year by 2000.

The technology to tun the heat in dry rocks is not, however, uvailable. It remains to be demonstrated as procticable. The technology involves drilling a hole in Impermenble rock until the hot zones are mediate hydraulic step with storage cupu-reached. The rock at the base of the hole is then fragmented to provide a heat transfer area sufficient to heat water circulated through the rock. This water would then be pumped down one hole and returned to the surface through another. An experiment to establish the fessibility of this technique is now in progress in New Mex-

ico, neor to Los Alanos.
If this technology could be demonstrated as feasible, a much larger potential contribution would be available from gealens of energy conversion seem simpler.
Thus, the HRS rectifier produces a conthermal heat. Hot dry rocks exist under stant hoad of water, even though of only our whole lond mass and in many areas a few metres. Conventional turbines, will be at necessible depths. Their exploitotion will depend on whether the more economic lie in areos of market demond.

Tidal energy rises from complex interactions between sun, earth and moon. In shullower coustal regions, these interactions lead to the build up of a head of water—the high tide, This head of water can be trapped and used to drive turlilaes. Some locotions are particularly fovourable for schemes to use such tidal energy. These are where the local coost-lines "focus" the tides. One of the best examples in the world is the Severn Estuory. Here the coastlines of South Wules sod North Cornwell, Devon and Somerset focus the tides luto on increasingly narrow estuory, and so incresse the head of woter avoilable.

Various schemes have been proposed to

ploce o barrage across this estuary and the most recent could be expected to cootribute something less than 5 intee of electricity and maybe as little as 2 mice, depending on whether its primary purpose is to generota electricity or to store

energy.
Such a body of water acts as a resonating system. As that that wave advances up the estuary from the open sea, it is narrowed and reflected from the estuary sides. When these advancing and reflecting waves reinforce each other, an amoli-fication of the tidal range occurs. This rainforcing effect is known to occur in

watt per square metre. So we connot such a resonant condition will be sensitive that the leaf flow as a renew tive to the tidal period and to the catuary abla energy source.

However, over long pariods of the estuary will have an effect on the tima, even such small hear flows do allow the temperoture of the Earth's crust to parrage until one knows whether its rise helow the surface. In some parts of the world hear flows well about the surface or reduce the solution. of the world heat flows well above average have raisad large volumes of rock or water to temperatures of 200 degrees centigrade or more at shallow depths.

computer to temperatures of 200 degrees centigrade or more at shallow depths.

Some of these are already being commercially exploited. The best occur most often again the major faulted areas—the plate boundaries—of the earth's crust, often associated with the earthquake zones. The UK is far from such zones, and its heatflows and remparature gradients are generally close to average.

There are, nevertheless, a few areas computer modelling and physical modelling of the estuary.

This turos out to be a complex problem. One of these studies also showed that although the barrage was considered to be within the grasp of existing tochnology, it would take 20 years to complete modelling and physical modelling and physical modelling of the estuary. tion of proved technology. Its economics of this stage do not look promising, but as for all these alternative energy sour-



had already been lost in all dimosaurs of

On the other hand, the theory of the

direct origio of birds from the thecodon-

dans was open to the objection that there

was a gap of some 50 million years be-

weco the last of the thecodontians and the earliest bird. This gap, however, was

explained away by the fact that the remains of all land vertebrates are ex-

mains of all land vertebrates are ex-tremely rare in Early and Middle Jurassic deposits, by virtue of the prevalence throughout the world at that time of conditions unsuitable for their fossiliza-

tion, and bird hones are in any case much

rarer than those of other vertebrates because of their lighter construction not

It was therefore generally accepted that, during the second bull of the Tri-assic period, tha thecodontia gave rise not only to the faur daughter orders men-

not only to the rain daughter orners men-tioned above but also to a fifth major line of evolution—the birds. Many hooks re-produce Heilmann's restoration of orni-thosuclus as a typical Late Triassic thecodantian which, as its name suggests,

was considered to be a likely candidate for the position of bird ancestor; little did their authors realize that ornitho-

suchus Ilike most other thecodontians) was not the small, lightly huilt biped of

popular imagloation hut a fairly large, heavily constructed animal that prubably

The first few years of the 1970s, how-

ever, saw three entirely different challenges to the orthodox belief just cited;

their only common characteristic was that each attempted to derive the birds, not

from the truok of the archosaur family

ree, but from the lower part of one of its main braoches. Peter Golton, in 1970, returned to the view that the birds had common origin with the ornibischiam ("bird-hipped") discours; Alick Walker, in 1977, put formeral the stration

Walker, in 1972, put forward the startling

new idea that ic was birds and erocodiles

that were very closely related; and Joho Ostrom, in 1973, restated the belief that

spent most af its time on all fours

greater fragility.

BRITISH ASSOCIATION 144

Controversy on origins of birds

by Alan Charig

Few people reolize how little we knaw af the family trea of the backboned animals. Even Sir Peter Medawar, Nabel prize-winner in medicine and zaologist of interwinner in medicine and zaologist of interoctional repute, wrote less than 20 years
ago that the broad outlines of vertebrate
phylogeny had sheady been pretty well
mapped by the end of the mineteenth
century and that all that remained for
comperative anatomists to do was to fill
in the minutlae in the "parish registers
of avolution." of avolution".

With respect, Sir Peter's opinion seems to be without any faundation in fact; for, though we aften know the details of the evalution of individual groups (for example, of the horses) we are remarkahly ignarant of the links between the major vertebrote classes (fishes, amphibians, reptiles, birds and mammals). It is therefore those class-to-class transitions that are the most interesting—and the mast cantroversial.

Birds, af caurse, originated from ceptiles; that is not doubted by unyone, apart from fundamentalists. The key pterosaurs the flying membrane of the animol hera is acchoeopteryx, from the Upper Jurassic Lithographic Limemonsly elangated fourth imager). While stone (140 million years ald) of Bavaria, perhaps the most famous and certaltly the most valuable fassil yet illscovered. at Hanrlem in the Netherlands, Ostrom Until foirly recently only two specimens of this craw-sized creature were known: the ariginal type-specimen (found in 1861) belonging to London's Natural History Museum and another (found in 1877 and simittedly rather better) housed in

Archaeopteryx has always been regarded as the classic example of "evalution chight in the act"; though classified as bird on account of its feothers, regarded as absalutaly diagnastic of the class, in ather raspacts it has seemed to be a perfect intarmediate between reptiles and birds. But which reptiles were its immediate ancestars? That problem is very diate ancestars? That problem is very far fram sattled, despite the contrary impression given in mast textbooks.

Perhaps we should give a few details of the "mosaic" nature of Archicopteryx. It pussessed, in addition to its feathers, unother structure unique to hirds; this was the wishhoue, shaped like a boomerang. Its polvis, too, is avian in that the pubis appears to be directed downwards publis appears to be directed downwards and backwards, not downwards and forwards as in dost reptiles; the first toe was seemingly oppasable so that the foot could grip the branch when perching; and the apimal was equipped with what ore usually called wings. But it lacks ather bird specializations, such as the smalle-shaped articulations between the vertebrae, the strong median keel to the breast-bone fur the attachment of flight muscles, and the special air-spaces within the bones.

IIRITISH ASSOCIATION CONTRACTOR C

the bones:
Indeed, in many important respects
Archaeopteryx was still very much a
ropelle; most conspicuous of its reptilian features are its teeth, its long bony tail, the three complete rlawed digits oo each forelimb and the fully deve-loped filmla. One of the few truly transitional characters is the number of vertehrne fused into the sucrum; this is six at most, a high figure for a reptile but much lower than the range found in modern birds (1-23).

The present decade has seen a great resurgence of interest in this animal. In 1970, l'enfessor John Ostroni (from the Penbody Museum of Natural History at Yale) was making a study tour of Eura-pean museums; his particular interest lay in pterusaurs (more popularly lout less entrectly referred in as ptermlaciyls) which, though flying reptiles, are in no

Bearing in mind that this specimen too came from the Lithographic Linestone of Bavaria, Ostrom realized at once that what he was kolding was yet unother

Admittedly everyane has hitherta regarded the arigin of birds as lyiog within one purticular area of what was undoubtedly n very brand spectrum of Mesazoic reptiles—that is, within the



Plaster cust of the Berlin archiconteryx,

archosours or "rullog reptiles". The rechasairs themselves ariginated at the very begioning of Mesazuic time, some 225 million years ago, and their hasic family tree is very simple. It consists of a steen order at the bottam, the theredona steol order at the bottam, the theroughtia of the Triassir period, which, thring the later part of their camparatively krief history, gave rise to four daughter orders: the theodontia themselves. True, is the creatilia (crocodiles and their relatives), the samischia and ornithischia to the nineteenth century to link additional to th (the two distinct groups which are to-gether referred to as "disosours"), und, already mentioned, the flying oterosauria.

The crecodilin survive to the present day, but the other three daughter urtlers all became extinct at the end of the Meso-zolc era. If the birds tao are derived

from the archosaurs, then their near living relatives must be the crossis (this is not disputed); but where easy should the birds be fitted into the fact

bitch had actually evolved from saurischian (* lizard-hipped *) dinosaurs—not way back in the Triassic, but much later, during the Jurassic period. Immediately a Until 1970 it had been regarded great contraversy arose. Golton's themry is superficially the most attractive, simply because profithischians and birds (as the name of the former npteryx with one or other of the dissinders; but these had all foundered group implies) possess very similar ac-rangements of the hip banes which are quite nalike those found in any other what seemed to to one insuperable is jertion, numely that archaeopterys all later hirds still possessed a peak clovicles (callar-hones) fused together form a single sylshbone, while the classes animals; but alas, even the earliest orniiblichians possess so many unique specializations lacking in hirds that there can be

tractors. The most common incident is one in which the driver is proceeding down a track, on the side of which is

getting clothing caught in a rainting part,

archients to terms of how the person in-ordered made an error. He tank too big a risk, did not plan carefully enough, things impressed too quickly, he did not notice something out so on. One can look at what design funds contributed to the fatality or what legislation if oilhered to nould have avoided the incident and so nn. Note that this is much more a naturalistic even homanistic approach rather than n formal statistical investigation.
It seems to me that the loss of information in putting this kind of information in putting this kind of information.

some from dimerical canciosions are point we can consuly possible improve-turning illections and feasibility in pas-ulting illections and feasibility in pas-

Aliaplified Family Tage of the Archosaua Reptiles SHOWING FOUR THEORIES OF THE ORIGIN OF SINDS

ship claser than their common archasan

heritage. Galtun soon recognized this

He further contends that his conclusions

are supported by studies of the rest of

the skeleton (especially shander-giralle,

and gliding stages to develop true flapping

are those of Ostrom, who has revived the

belief that hirds are directly descended

Completely apposed to Walker's ideas

elhow, wrist und ankle) and of compara-tive embryology. All this led him to the

and wisely recunted.

flight us hirds.

no justification for assuming a relation- are the small, lightly built, bipedal carul-

ins direct from thecodontinus. Suffice in work is too great. On the other hand in remaining anecdotal one bases the rigour of reliability and statistical significance. Some broad annerical canclosions are mostly and can be sore beloful in determining an end can be sort be sort beloful in determining an end can be sort be sort beloful in wurk is too great. On the other hand in

vores called coelirosaurs. Ostrom millifies

the clavicic oldection, mentioned above,

a chelprosum in virtually every particular.

near Eichstätt in 1951.

teryx skeleton.

indeed a fifth archaeopteryx has recently

been recognized in a " coelurosaur " found

He claims, for example, that the wing

cochrusaurian features of the archneap-

sible ways of reducing futalities.

For example, it emerges from the above kind of analysis that there is an irreducible minimum of obout 20 percent of the current rate—there are accidents where the person involved taok a recomminder risk hat he was unlucky—that unexpected actually happoned as it is hound to do sometimes. About 30 percent are susceptible to a uvoidance by greater awareness which might mean having more knowledge or inst being mure coreful. The remoluting 50 per cent are most susceptible to reduction by botter training, procedures or design. This is obviously a rather appraximate picture highly

Thera is no comprehensive theory of human error, there is no general method for the analysis of accidents. Nevertheless aur understanding of the total problem has improved stessilly.

If we ore concerned with accidents were the proposition of a team.

problem. Just os a weed is a plout luthe wrong place so an accident is onergy in the wrong place so an accident is onergy in the wrong place. The energy occessible to individuals or groups continua to increase and with it the parentiality for sarlous accidents. We must analyse and deacribe the problem in order to contoin

At present this is an art as much as a science. The skill of the error and safety analyst is in selecting the appropriate theory or set of supporting theories, the appropriate classification of events and the appropriate sources of evidence in

y that Ostcom's ideas are now accepted by the majority of specialists, though certainly may by all, and this is doubtless doe in part to the fact that his arguments are far easier to understand than Walker's, leagners to the fact that his arguments are far easier to understand than Walker's, leagners are really all depends on how one explains Ostron's impressive list of advanced skeletal characters common to archaeopterys and the coolurasaurs. Walker believes that they are all the result of convergent evo-lation, of similar forces of natural selection operating on sincilar stocks; Ostron, on the other hand, is convinced that the similarities are so many and often so de-tailed that their pussessors must be closely

An interesting side issue has ariseo from Ostroor's theory of bird origins. In 1974 Bakker and Golton suggested that from Ostrooi's theory of bird origins. In 1974 Bakker and Golton suggested that the two dinostur orders were closely related to each other (there is no rest evidence for this) and that, contrary to existing beliefa, the "Dinosaurio" therefore constituted a valid classificatory group; further, that because dinosaurs were alleged to be warm-blooded, that group should be ranked as a class, separate from Reptilia; and that, because the birds were descended from dinosaurs (fide Ostrom) they should no langer he regarded as a separate class Aves but included within the Dinosauria.

Sadly, the three premises an which this major reclussification is based (dinosaurs are manophyletic, dinosaurs were warm-blooded, dinosaurs gave rise to birda) are nil highly cantroversial; the reclassification is therefore premature as well as being totally impractical.

Also a matter of intense controversy is the related problem of the moda af life of the corliest birda and the origin of filight. Were the first birds tree dwellers, progressing through climbing, jumping fight, or were they ground dwellers, gaining lift from their outstretched farellons as they ran—or even using them as insect traps? Walker is an "arboreal"

Walker's claim, that birds are more closely related to crocodiles than to any are onkouwn they might still have been other group of archosaurs, is based un what he believes to be a manber of remarkable similarities in the detailed anatomy of their skulls; he examined and only the skulls of modern examined and only the skulls of only the skulls of modern crocodiles and birds but also that of sphenosuchus, a late Triassic crocodilian from South Africa.

--according to Ostrom—everything falls into place; feathers and wishbone apart, the skeleton of archaeopteryx is that of a chelurosaur io virtually every particular, gaining lift from their outstretched fare-llobs as they ran—or even using them as insect traps? Walker is nn "arboreal" nuo, Ostrom is "cursorlal"; the matter is complicated, for some fervent suppor-ters of Ostrom's theories of bird origins are less enthusiastic about his ideas an tive embryology. All this led him to the idea that a comman successor of crocodiles and birds might have taken to a life in all modern birds twhether they fly or

the trees; some of the descendants of this "pro-uvim" would then have come down again to adopt an amphibiant made of the hind feet doe, with its allegedly perching first noe, differs not a while from the hind feet doe, differs not a while from The preblem, even more than that of again to adopt an amphibians unde of life as craendiles, while others would have passed through jumping, parachuting and fact, Ostrom was able to Instance 21 bird ancestry, remains unresalved. Both bird ancestry, remains unresalved. Both problems serie to emphasize how reliable scientists can differ widely in their interpretations of the same material and how little of the story of vertebrate evolution is known with any certainty.

There is no space here to detail the many arguments used for and against the The author is it the depurtment of puleontology of the Natural History Museum. He will be addressing the geology section (section C) on Thursday, September 1.

the safe working climate. ing. procedures or design. This is obviously a rather approximate picture highly or last enough, dependant on the interpretations of the particular analyst but it can form the basis for strategies of tackling the prohibit.

mare or less intelligent appraach to n given problem at a given time, sometimes

We are cleur about the importance, indeed the increasing importance of the system instead of with the problem. Increasing importance of the system instead of with the constant to constant the system instead of with the constant to constant the system instead of with the constant to constant the system instead of with the constant to constant the system instead of with the constant to constant the system instead of with the constant to constant the system instead of with the constant to constant the system instead of the constant the t operatur, to examina ways in which the allocotion of taska between man and machine, the coding and presentation of information, the design of controls, the training methods and the procedures can steer the operator into non-optimal performance. These are not really alternstlyga but rather complementory aspects of a comprehensive approach to the unitory business of errors and accidents, system functions and human functions when man is active in a technologically based society.

the apprapriate sources of evidence in relation to the particular problems.

Although there is a large rauge of the University of Aston in the done about it say be described relatively sumply. From the system view work is professor of upplied psychology at the University of Aston in Biruinghum. He will be addressing the psychology section (section 1) on Monticely sumply. From the system view work is professor of upplied psychology at the University of Aston in Biruinghum. He will be addressing the psychology section (section 1) on Monticely sumply. From the system view work is professor of upplied psychology at the University of Aston in Biruinghum. He will be addressing the psychology section (section 1) on Monticely sumply.

Consequences and theories of human error

by W. T. Singleton

Human errars are interesting and impor-tant far bath academic and practical reasans. Academically they provide us with one windaw through which we can look at the camplexities of human behaviour; it is no exaggeration to say that if we understand human errors we understand human psychology. Practically, behind every accident there is at leost one, often several human arrors and wa can avoid accidents to the extent that we can understand the content of the can understand the content of the content of the content of the can understand the content of the understand human errors we understand

erfors and it also provides us with the broad strategy for approaching this study. We have the possibility of what the generals call a pincer movement. We can start with accidents and trooc our way through their courselor restart in the through their causation pattern to tha underlying human errors, and we can simultaneously start with theories of human error and proceed to examine their likely impact on particulor practical situations. If we can coalesce these stu-dies, close tha jawa of the pincers os lt

were, we have made a contribution to human psychology and to human aafety. It oll saunds splendidly near and tidy and entirely worthwhile. Having tried it for some years convictions about worth-whileness remoin but neutness and tidlness receive unremittingly Just as the gen-eral fluds that armies don't in practice errors and accidents. The beginnings of

of human errars cannut be flited tagether without all kluds of laose ends and rug-

Starting from the theoretical side there isn't fust one theory about why nod haw peaple make mistakes; almast every psychological theory has same contribution to moke, each ane revenling a new facet of the prablem. One cammon underlying thame is that errors are not accidental. there are plausible reasons and explana-

rians but of enarmous variety.

Psychoanolytic theory proposes that many errors are deliherate und intentianal although not always causcinusly sa, cannected internally with the manifestawith aggression and revenge against

Human performance theory indicates that mony errors are consequences of human limitations in information pracess-

quence of a naisy information channel, speed and accuracy con be ragarded as complementary and numerically calcul-

able expenders of capacity.

Fleld theories locluding skill theory take a more gestalt view at errors as disturbances in patterns of inputs and outputs in space and time and stress, particularly the impartance of facilities for retreating from errors as well as avolding them in the first place.

Social thearies attempt to incorporate mativational and organisational aspects including the inculcation of carefulness and the development of organisations for recovering the enrors of iodividual mem-

Starting from the practical side there is hehave like the elegant black arraws on auslysis are in classification and there are a map so the theories and consciprences many different ways of devising classifi-

entions or taxonomies depending essentially on why one is doing the analysis and the personal interests and stylo of the analyst. For exumule, a classification of accidents aimed at finding out whose fault it was is quite different from a classification olined at finding aut why it hap-pened. A classification ta da with thenretical understanding is not the same as and apprapriate for suggesting remedies.

There are many athar difficulties in analysing occidents. From a statistical paint of view they are sufficiently rare to create prablems af sample sizes and of the what con only be described as the predomlinnt chance element in the relationship between errors and the ennsequences af errors. Fram a psychological paint of view there are many obstacles in the quest to find out from witnesses what huppened,

trary to popular belief in the colm security of rural life it is now one of the most dangarous ways of earning a living, ronking in terms of likallhaod in fatal accident with mining, fishing and construction statistics of troumatic damage are available, but discoses will take much longer to assess because conditions have changed so rapidly in the past twenty years. This is not only a matter of increased use of chemicals but also of more specialized activities soch as working in milking parloiura ar apending whole days ant problems of noisa, vibration and concentrated attention.

The industry is unusual in saveral respects. Accidents are not confined to the front one-year-olds to eighty-year-olds as most difficult to monitor because it is so strongly in fatigated and the first of the dingram. It is one of the strongly will be provided the front one-year-olds. The people involved are strongly will be provided the first of the dingram. It is one of the respectively and the provided are strongly will be provided to the latest of the latest

nribudax arganisation mea of manufed ing industry. The range of jobs is so we

vogue. Training is slmust entirely into-mal, skills are often practised intensity another year.

Because of the incansistencies el dent reporting in such a varied and persed industry it seemed reason concentrate un faiolities. Death the human desire to uvaid blame and responsibility, the vagaries of memory in relation to sudden and stressful events and so on.

Accidenta io agricultura or worthy of special study for acveral reasons. Contrary to popular belief in the colm security of rural life it is now one of the most

setting underweath it to make some mution in putting this kind of informo-adjustment, the tractor pulling itself over, tion into a systematic numerical frame-

the quolity of machino malalenants highly variable, although after very be lividence, particularly numerical in in the form of reparts fram firms, is man than usually suspect for all kinds of resums from lack of interest, secretivened ar even complete hostility an the part at the person completing the return libe cation of tasks and responsibilities is also seen to be a seen to be

some obstacle—a ditch, wall, hedge, or a slope up. He turns line it and the tractor mens over. The second most common is one in which he is driving up, down or across a field with a steep slope and he overture.

Others involve starting or stopping he tractor from a standing position near Retting on and uff the moving muchine,

from saurischian dimisaurs; the particular saurischians chosen as bird ancesturs in direct from the conventional theory of hird origins direct from the convention of the co Take, for example, death invulving or the individual just folling off the tractor or the trailer. Alternatively, one can analyse the

Industry must point

the way forward for

modern languages

Despite recent attempts to make modern languages

teaching relevant to the needs of industry, the

Nigel Reeves discusses the implications for both

secondary and higher education

already being established

chould grow more rapidly, while the colleges of advanced tech-pology were to be promuted to technological universities.

The report was entirely in time with the exciting spiral of its time, the call by the first Lohour Govern-

a management studies, modern languages had a special and "intreasingly Important" role in play.

of genetic conservation

by J. G. Hawkes

The population explosion of the latter last of the 20th century has brought with it overrrowding and malautrition, at the same time putting great pressure on ngricultural production and natural resonc-

more and more land under the plaugh in order to solve problems of funding and malnutrition, the depleting of untural forest, sovanna and scrub land, and the destruction of ecosystems, the drainage of marshes and the replacement of natural vegetation by arable farming and pasturage-all these are the end-effects that to be true, though with some reservapopulation pressures and the demand from the developed countries for more and more of the world's natural

Population increase has put a particularly heavy stroin on faod praduction in the developing countries, especially since the custs of fertilizers, pesticides and insecticides have risen so steeply in recent years. One way of increasing total faed praduction is to bring more land under he plough, but this merely accentuates the destruction of natural vegetatian and the habitats for wild animals, all of which should be conserved if the richness and diversity of our lives and those of our children are to be preserved.

Another way of solving the fnod prohlem is to improve production through more efficient farming methods. The most certoin and satisfactory way of improving, ant only total yields but also the patritional quality of our craps, is through ulant breeding.

Plant breeders are attempting to create vorieties with such qualities and ore olso endeovouring to croata forms better odapted to existing conditions us well as those resistant to extremes or drought, heat and cold. Since there is a continual struggle between our crops and their parosites, breeders ore also trying to help rrups, such as wheat in south-west Asia, ly incorporating high resistance to a while range of diseases and pests.

rrop protection, and to create varieties referred to as "genetic erasion", that yield well without heavy fertilizer The reason is that those highl treothents or expensive spraying pragronunes. Such varieties are of value everywhere, but especially so in the deve-laping world, where lack of exchange currency prayents a wide use of fertilizers thon has replaced diversity and short-term and chemical pest controls.

Plont breeding is not by ony means a

simple process. Breeders must first of all decide on the breeding objectives, then look around for the right materiols to breed with, and finally crente their varieties, often after 10-15 years of patient

ance to disease or adaptation to special of forest and scrub are also being climinnot in be found in the existing varieties. and the widespread grazing af cattle, In fact, we have now reached the point—sheep and guats, where the desirable characters readily—Much araise a where the desirable characters readily available are well-known and have either heen accurded to the Green Revolution. are in the process of being bred into

BRITISH ASSOCIATION TO THE RESERVE OF THE PROPERTY OF THE PROP

What the breeders need for all crops, are reservairs of variating, generally spoken of as gene pools, where useful have characters may be found which can be lens. built inta their new varieties. Brecilers sity; they must look for them, and conserve them, to dip into whenever necessary. But baw con these reservoirs be found?

Some 50 years ago the well-known Russian breeder and geneticist, N. I. Vavilov, The ever-increasing demand to bring pointed out that crop plant diversity was not spread evenly throughout the world hat was concentrated into some eight ar "centres of diversity" in certain regions only. Vavilov thought that these "gene centres", as he also called them represented centres of origin af the emps concerned. By and large, we still believe

> The regions of diversity spreading from China through south-east Asia, to India, central Asia, south-west Asia, Ethiopia and the Mediterranean region, and agoin appearing in meso-America (Mexico, etc.) und in western South America, represent to the breeder areas of extreme interest.

> In these, because of the wide range of habitats and farming practice as well as the extreme antiquity of cultivation, genetic characters of resistance and adaptation, as well as many others affecting the growth and maturity of the craps can be found. In many of these regions also one finds the wild nucestors of the crops, closely related wild species that can sometimes be crossed with them and even intermittently hybridizing complexes of crops and their attendant nearly related weed forms.

> If the prublem were no more than that of gathering the material from the gene centres whenever it was needed, and of beauting wardeness tocorpornting the decired feetures, it would hardly be worthy of special comment. Unfurtunately, this is nut so. What in Vavilov's day were considered to be inexhaustible gene paols are may beginning to vanish, and in same cases the diversity for certain has almost completely disappeared.

The genetic variability in these nuclent Thus the nim is to provide "genetic rentres of diversity, and indeed in other grop protection" rather than chemical areas also, is undergoing what is generally

The reason is that those highly lared now vorieties created by breeders have been so successful that in region after region they have replaced the old diversity of primitive forms. Thus stondardizahenefits have accrued. Better farming practices hove reinforced this trend oud have helped to eliminate the weed racos oround the fields ond between the Indlvidual plants of the crop itself.

Thus, by a paradox, the success of the plant hreeder is causing wholesale descruction of the very materials he needs Very frequently, the chorocters of resist- for the future. The related wild spacies

World problem and extremes, as well as those conferring good number lined qualities, are conferring good number lined qualities, are conferring good number lined problems with standard seed mixtures with standard seed mixtures.

been incorporated into new varieties or in which new, high-yielding, short-strawed varieties of wheat and rice have been intruduced into many developing countries. At their best, with heavy fertilizer applications and good farming practices, they have helped to solve argent food prob-

At their worst they have raused a cato cannot create these gene pouls of diver- straphic crosion of genetic resources, especially in Turkey, Iran, Iran, Afghanistan, Pakistan and India. It is even quite difficult to find the older bread wheat varietles in these countries, though they were frequent enough some 20 years ago.

At that time the Fund and Agriculture Organisation of the United Nations began ta recugnize that the genetic diversity of many crup plants, and especially than of the major cereals, was coming under threat. Same strategy of ennservation was thus argently needed. Pinneering work in the 1960s by R. O. Whyte, O. 11 Frankel, E. Bennett and many others, working through the FAO, began to farge the links that would eventually make this

It became rlear that diversity could and should be preserved, both in natural reserves (and esperially for the wild species) and in special germplasm collections, or gene banks, as they have been called. This is an essential activity for preserving the genetic heritage of fond plants, by which we all live.

In broad terms there are six series of nctivities, all of equal importance, to help conserve and use germplusm resources In the first place material in the field must be explored and collected. Strategies for proper sampling so as to rupture the maximum amount of genetle variability within un optimum explaration programme must be devised.

Serond, we need to decide an storage methods for each group of plants. Fin rrops reproducing by seed, it is usual to advocate seed stores and banks, hor resourch is needed on the best canditlans of temperature and humidity to prevent lass of ninterial and to conserve the seeds for very long periods. Certain crops, such as cassava, yams, potatoes and others that reproduce vegetatively may need to be conserved, at least it part, by tissue cultures.

Third, are must make sure that the material is available to breeders und that it is undergoing screening or testing for useful characters. In this way its value can he made clear.

Pourth, there must be some computerized infurmation starage and retrieval system to transmit data to breeders on the useful characters found in the materials and the gene banks in which such materials are stored.

Fifth, scientists ond technicians must receive training in these tusks, especially those scientists from developing countries where much of our genetic resources still exists.

Finolly, there must be a well-organised world body to coordinate activities, prevent duplication of effort and provide funding, and selentific and odministrative initiatives. Ohviously, the FAO hos played a key role here, though lock of odequate funding hos hompered activi-

Those of us who have worked through the FAO ond have advised on scientific and technical matters have helped also to establish the technical basis fur n newer body, known as the International Board for Plant Genetic Resources (IBPGR).

Regional organizations of groups r countries coordinating national genetic on a lighter note, part 5 route reasources activities have been established a review of changing patterns in various parts of the world, such as and recreation in the region. south-east Asls, south-west Asia, the Mediterracean region and Europe; training is expanding, and materials are being collected. Research in certain key areos is under way or being planned, ond gene bonks are being established.

Clearly tha problems of coordination and funding are lmmense. Nevertheleas, it seems fairly certain that ive shall be able to save ot least a reasonabla part of our heritage of crop plant diversity for the present and the foresecable future.

Millet field in India, one of the world's eight gens pools

The author is Mason professor of bottom Urban Environment, University of Plant biology, University of Birmingham. He will be addressing the bottomy section (section K)

The author is Mason professor of bottom Urban Environment, University of Birmingham. He will be addressing the bottomy section (section K).

The author is Mason professor of bottom Urban Environment, University of Birmingham. He will be addressing the bottomy section (section K).

The author is Mason professor of bottom Urban Environment, University of Birmingham. He will be addressing the bottom birmingham. He will be addressing the bottomy section (section K).

The author is Mason professor of bottom Urban Environment, University of Birmingham. He will be addressing the bottom Urban Environment, University of Birmingham. He will be addressing the bottom of Birmingham. He will be addressing the bottom of Urban Environment, University of Birmingham. He will be addressing the bottom of Birmingham. He will be addressing the bottom of Urban Environment, University of Birmingham. He will be addressing the bottom of Birmingham. He will be addressing the bottom of Urban Environment, University of Birmingham. He will be addressed and Published by Times Newson and Indian Urban Environment and Urban Envir

of change in the cities

by Frank Joyce

It has been 27 years since the Big. Association for the Advancement of \$ ence held its last meeting in Birming lince that meeting, in 1950, both their Midlands region and the Biming Black Country conurbation have encountered fundamental Industrial, coose and social changes.

To mark the 1977 Aston meeting of British Association, n group of attention civil servants and local government pr ners have callaborated to profess volume reviewing the major diseases of metropolitan development water that have accurred since 1954 The volume was produced why the

guidance of a small editorial mains representing the University of Assats City of Birmingham, the West Milet Chunty Conneil and central gormez chaired by Frank Joyce, Hed of the foint Unit for Research on Urban b vironment. It causists of 23 chape divided into five parts. Part light the key dimensions of change in the Re Midlands and provides a broad over of the union categories of dang terms of the changing institutional



erns, changing planning framewer the rule of the region in the me

Part 2 addresses a taple of funder importance for the arra: Industries employment rhange. Five the theme, ranging from inner city en mem problems to the contribution to the regional economy by the t National Exhibition Centre. Part 1 is concerned with housing

the physical consequences of choose the region, and of the policies that hern developed to accommodate change. The development of Green pulicy, seen as a response to both tremendous pressures for expension is within the countriation and new designants in trousport, is reviewed, to with Birmingham's intensive slummane and redevelopment programmants of the 1970's and 1

l'art 4 covers the provision of in the necessity of

On a lighter note, part 5 roation a review of changing patterns of least

and recreotion in the region.

Metropolitum Development and the is on informative book; it couling is on informative book; it couling pages of text and 100 pages of looks tions covering a wide range of looks should be of interest to decision as should be of interest to decision. In both government and industry as students of planning, geograonics onl environmental stu book will be available to members
British Association and conference pants

pants at a discretionery pri approximately £4.50, Advance should be addressed to the Pub

Med for reappraisal

The early and mid-50s, when the Rabbins expansion of the universities was inhimed, now seems like a Gulden Age: the used for higher education, the Robbins Repurt had as helieve, was prodigious—It was an argent need of critical pruportions. The new universities that the need of critical pruportions. The new universities that the need of critical pruportions already being established. n inclindology and a scholarly approach to problems, but the chance to, and indeed the necessity of, comparing widely divergent methodologies.

But as we all know only too painfully, reappraisal cannot be confined to examining the language courses established at Surrey and elsowhere 10 years ago. The reappraisal has been forced upon us by the country's present critical

by the country's present critical economic sinuction, which has profoundly effected the atthudes of prospective undergraduates and the physical grawth of the universities, It is now not only the duty of universities, but a necessity, to examine in what new ways they can contribute to a regeneration of Reitich industry. can contribute to a regeneration of British industry, a regeneration without which the quality of civilized life in comparison with our owa past and with the present of our industrial neighbours will continue to enforce providing decline.

to suffer a pernicious decline, to suffer a perficious decline.

As we saw, the Rubbins Report recognized than languages, no less than science, technology, and management studies, have a central role to play in an export drive. The Federation of British Industry was taken by no doubt about that. Two excellent reports, Foreign Languages in Industry of 1982 and Foreign Language Needs of Industry of 1964, they uncention to the significant advantage which one their expect testle.

The significant advantage which our fureign compensors enjoyed in their name widespread knowledge and use of fureign languages in its education programme. The Centre for their expect testle. Imagings in descence, a most helpful and research, a most helpful and valuable holy, has no specific in-

But it would be totally wrong the inagine that university language studies continued to accept a reside role. When the first honours touries were established in the bettern so firmly set by the classics, to which they were considered a parallel, with a predominant emphasis on reading the major first out on learning the language of Latin and Greek were learn. But it would be totally wrong their export trade.

The CBI, succeeding the FBI, recognized that British firms needed to know how to find reliable translations services and in 1967 produced a very sound guide to the do's and dian't's in abadining thuse services. From this document it emerged clearly that translators needed unt only to be highly skilled linguists but experts in specialist technical fields.

A number of universities

within the conurbation and new designation within the conurbation and new designation in the conurbation and new designation in the West Midlands and the camples are given of buildings and correct monuments that have been less that properly the region through an over-zealoute in new mitter on the amount of dereliet land and set of the amount of dereliet land and set

In the interrening eight years one might have reasonably be it be said from the outset athe more eway from the tradical literary ond philological attraction. Indeed an entry to the European Economic Community in European Economic Community in the stay one, it is painful not attract tradition, but the literary and philological tradition, but the proach has such deep listarities. The new courses had to the say themselves acadeonically; the saying as a discipline.

The surrey course as conceived the beautiful to the simulation. Indeed unit entry to the high industry most urgently. Amnzingly, however, the CBI, as far as I con inscribing discalisfoction of employers with the lunguage profication on languages and industry ever since.

I have heen analy to the high European Economic Community in the Euro

results, and industry's response, have been disappointing.

clude forulan languages in its education programme. The Centre for Information on Languago Teaching and Research, a most helpful and valuable hody, has no specific industrial brief or connexions, while the newly formed unincella forum of modern language associations in Britain, the Nathural Congress on Languages in Education does not yet uppear to envisage a working party on languages and industry.

Some of the reasans for this situation in the endemic repugnance at the British for foreign language learning, itself the result of possessing the world's lingua franca, thanks to influence from the seventeenth century through the colonles that the United States.

Secondly innertance groduates have party on languages and industry,

In short, there is no central or official budy concerned directly with the role and promotion of longonge proficiency or services in British industry, while die interest in any such promotion has declined, scendingly in inverse proportion to our commitment to non-Facilia.

Thirdly, the graduates themselves may not be the states of the services in t to our commitment to non-English speaking trailing purmers.

The only rolatively recent surveys we possess of the expressed demand for longuoges in industry demand for longuoges in industry are those of the Loudon Chamber of Commorce, carried out in 1972, and of Emmans, Hawkins and Westoby for the Languoge Teaching Centre, University of York, published in 1974, last based ineritably on a questionnaire distributed some two years earlier. some two yeers earlier.

The Enmans report offers one chouraging statistic: that the parcentage of language fractions and the results graduated in the parcent of languages in monitoring posts has risen from 12 percent in 1960 to 38 per cent at the time of its survey. The number of the survey of professions wooten entering such professions has risen marginally more than men, and the call for greduote interpreters and translators has also risen, os boya tha number of graduote bilingual secrotaries. In both these cotegories the predominence of women is evident.

in that tradition, but that tradition, but the lunguage profice in the process of the process of

may not have lived up to the expectations of their employers. An examination of German longuage examination of German longuage or of the state of the sta

Now, according to the York Report, the preponderant need of language graduates in Industry was the Condon Chember of Commerca found that In the non-specialist uso of languages (that is, not for techof languages (thin ls, not for technical tronslation) 49 per cent of the time was apent in listening and speaking and only 19 par cent in reading and 17 por cent in writing. The importance in university, lunguage course of conducting instruction in the foreign language itself and of students participating in seminar discussion of topics in tha foreign language is plain, quita apart from the conventional conversation classes with nadve

fallen substantially. Herman above made progress, and when we hear in mind the age group as a whole intreased by 10 per in size during them. in size during these years, it is the only language to have kept pace. At Advanced level, the pattern is

of greater immediate significance for the universities and pulytechnics and, alus, is more sombre. First one should note the relatively small member who actually proceed in A level, only one in six in French and German. Here there is an absolute decline in French, while compared with the increased age groups, languages as a whole fell in favour. Germany alone shows a small steady increase. greater immediate significance

shows a small steady increase. One of the gravest tendencies, it Due of the gravest tendencies, if appears, is the introduction of language teaching to mixed ability classes, which from rates and doctooses the motivation of more able pupils. Furthermore languages are considered one of the hard subjects, like science and mathematics, and where there is a chaice pupils are avoiding them. This amplies particularly to mat-d level work where the accordance in the chain of the previous andio-visual techniques are neevlous audio-visual techniques are no langer central and sometimes harely relevant.

Lastly, and most gravely, languages are considered to have a low carrer relevance and it would appear that careers teachers openly lisconrage pupils from pursuing

Examination resorms

What conclusions may we draw, and what steps need to be taken? First, it is imperative that attention is fucused especially on the plight of the so-called minority (had in fact uniority) languages in the secondary schools. Porticularly in mrban areas it may be possible to alternate the first language taught ac various schools so that pupils have at lenst the apportunity to take German, Spunish or Russian as their first language at one school in their first language at one school in their city as un alternative to the present ionilanice of Freach.

Secondly, some schools could start in alternate years with Freech or Germon, or there could be e verticul split with some taking French and some Germa as first tanginge. But usero significant for tertiary education must be the reform of our schools examinations. These still due from the pre-comprehensive era and are ill-sulted to the new conditions.

the new conditions.

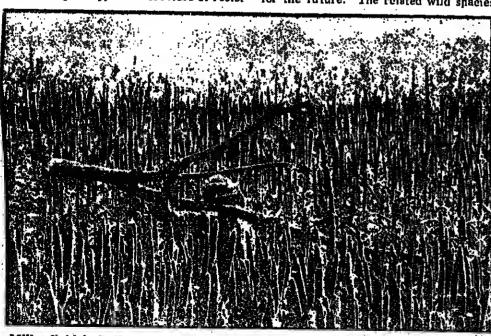
As an immediate remerly, more boards need to look of their A lavel syllatus in view of pupils' significant discontinuation. But above oil loaguages would benefit from the aduption of a scheme more similar to that found on the continent, where pupils take more subjects up to the school leaving conficate but at a loss specialized level. If there were, suy, five subjects, of the 18 plus level, linguists could toke two or even three longuages, while or even three longuages, while scientists or historians or economists could still pursue at lenst one lan-

gunge in university entrance lovel.

At the university level, successful applicants for non-languago courses, or those who wish to study e louguage that was not taught at their school, should be able to ottend intensive ob initio courses of a year's duration. This would, of course, tronsform soms present three year courses into four year courses. But it could add o fresh dimension to the knowledge and

dimension to the knowledge and porspectives of a new generation of scientists end techoologists, managers and teachers.

Listly, and of the vimost importance, we need to explore the posable future role of languages and graduoto linguists in industry and commerce. The only research information was preserved. furniation we pussess refers ta British industry four years ago. It would be extremely usoful if there were a centrol committee responsible for coordinating the efforts of the universides and polytechnics will industry and for univertaking research.



Semantic confusions and confused semantics

Semontics, rolume one by John Lyons Cambridge University Press, £12.00 and £13.95

Semontics, rolume one by John Lyons
Cambridge University Press, £12.00
Since inst people, including ocalemiles, are more interested in this meaning of sentences than in their grammar, one would expect semantics to be a pspular and flourishing branch of linguistics. Questions which sites in other branches of linguistics—does linguistic description require two levels of gramomical structure? Is the concept of the phoneous indispensable?—generate excitement within the discipline but do not compel ottention from all those who lisve a pstential interest in semantics. Large numbers of layaren, who in this case include philosophers, psychologists, sociologists, anthropologists and literisty critics, anthropologists and literisty critics, anthropologists and literisty critics, and to know what is the relation—transfer of the part of the bosk: a discussion of sense, reference and denotation, ugeneral chapter on structure? who lisve a pstential litterest in sent-autics. Large numbers of layanen, who in this case include philoso-phers, psychologists, sociologists, authropologists and literary critics, need to know what is the relationslip between the meenings of words, the meanings of sentences, and the can account for menning in each case. If semantics could offer an authoritative account of linguistic

It is therefors stronge that semantels has been the least developed branch of linguistics and that even today it remains the most problematical. In other oreas of linguisties unc can at least outline the esin-peting theories and their sreas of disagreement, but in semantics it is disagreement, but in semantics it is not even clear what claims are made for various proposals. In the absence of powerful semantic theories, philosophers, literary critics, sociologists, etc, have had to fashlon their own accounts of meaning, and for this reason senonties is both an mentivated end an over-run field.

But if onyone can tidy and authoritatively organize the field, it is John Lyons. Since the appearance of his Structural Semontics in 1964 he has shown his telent for judicious synthesis in bis Chomsky (1970), for the Fontene Modern Masters corles and above sli in his futroduction to Theoretical Linear futroduction to Theoretical Linguis-tics (1968). The virtues of this last tics (1968). The virtues of this last book, which have led teschers to retain it os the leading text-bsok despito swift and fundumental changes in the subject, are novinus and substantial: technicol terms are scrumiously defined ond indexed; possible misunderstandings are anticipated and deelt with; any simplifications are explicitly noted and the problems identified for later discussion; but obove all the focus is on issues and problems

longuage 'communicates different sorts of information and that a rationalist semantics, locasing on

tion, u general chapter on struc-turs sementics and semontic field theory, and an excallent account of sense relations of various kinds.
Volume two, we are promised, will be somewhat more advanced only will sense the sense that there are senses. mor, lexicon, the theory of speech acts ood modality, deixis and etyle.

The two volumes will doubtless constitute a most impressive achievement, displaying of greater lough and in greater lough and greater l nchlevement, displaying of greater length and in greater detoil all the virtues of his earlier work. Indeed, if his work less a fault it is this excess of virtue. Anyone who has repeatedly assigned his works to students knows that they do not often give pleasure. The render plods through one exemplary chapter ufter another; each tells him what it will discuss, which of numerous possible difficulties it will not consider or will postuoue until loter. his work lass a fault it is this excess of virtue. Anyone who has repeatedly assigned bls works to students knaws that they do not often give pleasure. The render plods through one exemplary chapter ufter another; each tells him who it will discuss, which of numerous possible difficulties it will not consider or will postpowe until loter, judiclausly setting aside contentious fing things to a close with a "we shall not pursue the question for the sense of the moment and bringshall not pursue the question for some of some ostabilished aig.

The content to devise of out to devise in the concert an unjustified idealization. In netual conversation and nhsent-mindedly nod assent or else listen sceptically while wondering the present the forcetor into us the norm Lyons shaws little interest in the complex reality of bleolizations and simplification is such structural structural structural structural structural structural structural structural in netual conversation and nhsent-mindedly nod assent or else listen sceptically while wondering to feel latents of the second an unjustified idealization. In netual conversation and nhsent-mindedly nod assent or else listen sceptically while wondering to feel latents of the second an unjustified idealization. In netual conversation and nhsent-mindedly nod assent or else listen sceptically while wondering to feel latents of the second an unjustified idealization. In netual conversation and nhsent-mindedly nod assent or else listen sceptically white wondering to not religion of internation and nhsent-mindedly nod assent or else listen sceptically white wondering to not religion of the second an unjustified idealization. In netual conversation and nhsent-mindedly nod assent or else listen sceptically white wondering to not religion of the second an unjustified idealization. In netual conversation and nhsent-mindedly nod assent or else listen sceptically white wondering to not provide the second an unjustified idealization. In

shall not pursue the question further".

We shall not pursue the question further", which indeed serve os Lyons's heroldic device, the very emblem of his writing. Careful to remlind his renders that everything might be pursued further, he serupular lously olerts them to the foet that he is stopping. There is no patticular reason for stopping here rather than olsswhere, but going further is would not, it seems, advance matters; none of those questions have is an irgency which tequires them to the foet that he is stopping. There is no patticular in the series; none of those questions have is nurgency which tequires them to the foet that he is stopping. There is no patticular in the series is continued in the foet that is in the interval of the foet that he is stopping. There is no patticular one is continued in the foet that is subject to the question here is continued to the question-legging formulation were something which could simply he moved from one place to have some questions begged. And indeed, succeeding chapters explicitly have themselves in simplifications and idealizations without inquiring whether this stristgy has implications for himself and the question-legging formulation (as if information by mann, of, some would have subjected hoth to the crestrictions mult to the question-legging formulation (as if information were something which could simply he moved from one place to subject to the question-legging formulation (as if information were something which could simply he moved from one place to subject to the question-legging formulation (as if information were something which could simply he moved from one place to subject to the question-legging formulation (as if information were something which could simply he moved from one place to subject to the question-legging formulation (as if information were something which could simply he moved from one place to subject to the question-legging formulation (as if information to the question-legging formulation (as if information to the question-legg



disinterestedness.
One could make much the same One could make much the same point in other terms by saying that Semanties is not a tadical reexamination of the foundations, goals, and purposes of semantics. It will not give the discipline a new shape by questioning old assumptions and establishing new priorities.

At lirst Semantics does look like a bask which will put everything in question. The opening chapter em-

latar discussion; but obove sil the focus ie on issues and problems tather than on received doctrino, on what is at stake rather than on moment believed to be the case.

Given Professor Lyons's ochievements, the first volume of Semanthe autumn; is everything one might expect: lucid, acrupulous, comprehansive. After n preliminary chapter which introduces a host of terms and distinctions, three general chapters discuss language as semiotic system, emphesizing that

student should excitedly approsch.

This excitemant, this sence of there being pressing questions which sends of there being pressing questions which sends of there being pressing questions which sends of the doctrino, on what was st one moment believed to be most sallent feature as flinguistics sends of there being pressing questions which sends of there being pressing questions which sends of the excitemant, this sends of these being pressing questions which sends of less distinguishable functions [of the ot less distinguishable functions [of there being pressing questions which the accidence of the descriptive, the deviation is social sund the syrossive." Ons would be happler to comply if one at work in this very sentence. It is clearly not descriptive, but is it torle can be treated as a derivative of deviation from this norm. One would determine which function is at work in this very sentence. It is clearly not descriptive, but is it torle can be treated as a derivative of deviation from this norm. One would determine which function is at work in this very sentence. It is clearly not descriptive, but is it as two work in this very sentence. It is accis! ("serving to establish and maintain social relationships") or expressive ("for the axpressis of linguistics purpose and excitement.

This is, however, precisely what the produced satisfying results, but to descriptive, but is it torle can be treated as a derivative of least mind this prucedute if it produced satisfying results, but at work in this excitedius and not in the least mind there is one i Lyons, "that these are three more of less distinguishable functions [of

beingunge-helaviour is that which occurs in face-to-face emversation between members of the same rulturs; and this is what will be mean the by the term 'normal language behaviour'. All other uses and manifestations of language, both written and spoken, are derived in one way or another from normal language behaviour understood in this sense."

Even if we were to grant that fucctor-face conversation is more frequent and therefore in some seuse more "typical" thun other linguistic notation, such as right world expect the linguist and logicians who use these terms to onsure that reference refers in described in the reference refers in describable whys, that density is described in the same is the same in the same is the same in the same is the same in the same in the same in the same is the same in the same in the same in the same is the same in the same is the same in the same in the same is the same in the with Isaguage, telephune conversations, television viewing, etc) it does not in the least follow that the other monifestadons are derived from the more frequent manifestation; nor is it clear. from the more frequent manifesta-tion; nor is it eleor what benefit should follow from an attempt to cansider Lyuns's Semantics, with all its special typographical devices ond its atterly uncunversational prose, ss "derived" from face-ta-At lirst Sentontics does look like a book which will put everything in question. The opening chapter emphasizes the ambiguity and problematical nature of one concept after unather. Further discriminations or always necessory. Indeed, it seems that if one set out to deviso a server that would resist describe.

share with textual situations.
Face-th-face conversation is a
metaphor for unproblematic communicstion where a specker intends on
ussertion about a state of alfairs
and a listener grosps this latention through the language addressed to him. The assumption seems to be that problems about meaning and reference arise when speaker and hearer are separated from one mother in various whys but that normal, face-to-face commodication is unproblematical because the speaker says what he means and the listener, in the same simultan as the speaker, grasps this meaning.

Semantics has usually proceeded on this assumption: that "narmal" communication is direct and unpro-blematic and that the literary, the ironical, oud generally the non-ssser-toric can be trested as a derivative deviation from this norm. One would

Can we and should we "simply assume" the appropriateness of these categories? Such problems are not discussed.

Or consider the following statement: "The most typical form of language-heliaviour is that which occurs in face-to-face enversalian between members of the same rul.

composition are kept under combined and but Lyons must repeatedly use readers about die confusie and rounding these terms ("the win should be on the guard where he meets the term 'conocide the ottempt to specify their rage of meandags.

Linguists and logiclar, thous committed to the provide that to committed to the principle that a pressions have stable denotation and refer according to some takes and refer according to some takes and refer according to some takes a keep denotation and reference under control. They have produced a chaos at least of great to the surrounding the terms of errolar speech. There is a lesson which semantic does not want to lears.

It would take a more radical adperspictions book that Lyon's to work out the nature and the improved out the interest and the improved out the interest and the improved out the interest and the improved out the committee that what we encounter in linguistic stilving and other than the committee of the committee of the committee of the controlled. They are never single transparent elements of stable and controlled.

to discera the human being, and yet at the same time capture and partray the quadities that led Pearse, the middle-cluss, half-Eaglish, respectable Dubliner, to the Easter Rising at 1916 and chimately is the firing squad, to martyrdom and to pulitical beniffication. To do this calls for not only historical, but also literary and psychological skills, and Ruth Budley Edwards possesses and of these qualifications. The great merit of her biography is the way is which she weaves together the personal and the public forces that drove Pearse un to his fute. Pearse was a man of embusiasms, that drove Pearse un to his func.

Pearse was a man of embasiasms, to whom the ordinary things of life, such as money, ecotions or faedship, meant little, or were important only in an far as they affected his causes. Whotever sized Pearse's integration, whether it be the trick language, Irish distand and guverned his whole behaviour. This is illustrated by the fact that helore 1910 the was hardy interested in Irish publics and and was upparently content to be a mild kind of Home Ruler. It wishlo six years of his initial intent in political affairs he had more from Home Rule to separation, and had died for his recently course. controlled. They are never sing transparent elements of seeds a the idealizations of semants of try in suggest. The linguisticist language lies in the evasivoress of upacity of linguistic element opacity of linguistic element ludged, one might suggest that it primary law of language is solid to heliave in ways which violet up principle of structure or argainstian that linguists postulate. Lyes is aware of the many difficults which linguists' formulations to counter and repeatedly indicate that theoretics I statement as the many life of the orthogonal transfer of the ort, a necessary step is an argument of the ort, a necessary step is an

Week.

This hiography, however, has a wider interest than modern Irish politics. Pearse is part of a mace general phenomenon in cultural and political history. He is a supreme example of the intellection in revolt, and where examples such as Stocker. und other examples such as Stephon Spender, C. Day Lewis, and Christopher Candwell come to

Patrick Pearse: The Trimmph of Fallure
by Ruth Budley Edwards
Goffance, 27.95
ISON B 575 02153 5

Br Ruth Dudley Edwards has chosen an appropriate into to pain in the prospect of relamed and profitical interpolation. He was a man who hand heigh study of ferband's most famous revolutionary have now herome available; and political perspective. Even as little as a decade ago a scholarly work of this kinal would have been difficult, if not impossible, to write. Indeed, an is not mercly difficult but almost blasphemous to discern a funnam heing of fisch and blood" in the personality of Partick Pearse.

The merit of Roth Dudley Edwards how is that she is able a discern the human being, and yet at the same time capture and pounds are the fearse was a cross that he can be safely be defined by the control of the capture of the last generation of the capture and yet at the same time captu Perhaps fundley Edwards might have made more out of this. Pearse und Byron bear an even closer Comparison. When Byron in Italy revelled in the enupany of his Carlomari cranics" with their haymets, fusls, cartridges out what not he was unterpating Pearse, with his bye of soldierly transings of guns and denus and Pearse, with his bive of soldierly trappings, of guas and drams and woulds. The words of the tival horoes are almost interchangeable. "It is no great maner" wrate flyring in 1821, "supposing that half could be liberated, who or what is sacrificed. It is a grand abject—the very poetry of politics." Substitute fremul for lady, and these are the sentiments of Patrick Pesrse.

The book concludes with an application.

Duiley Edwards shows that Pearse was given the chance of making his "blond sacrifice" largely because of two factors. The outbreak of the Great War, which made some somewhat was the works. sentiments of Patrick Pessse.

The book concludes with an analysis of Pearse's legacy to Irchard and to his family. His legacy to both was notivisive one. To his family he left not only drbis, but ulso the burden of living with the meatory of a man who had become a legend; to his country he bequeathed the hurden of living with a principle, the principle that patriots have the right, indeed the duty, to resort to violated. authrenk of the Great War, which made some separatists see that once again England's difficulty might he came Ireland's opportunity; and the netion of the Irish Republican Brotherhood, which came to recognize in Penrse a figurehood for the revolution, a man who could fushing words and influence minds. The IRI would provide the guns, and Pearse would provide the guns, and Pearse would provide the poetry. Their choice succeeded beyond their wildest dreams, for although Pearse probably did not fire a shot during the week's fighting in and around the General Post Office in Dublin, and although he lanted actual, as distinct from poetical violence, in the end his name became associated more than that of any other man with the dranta of Easter Week. lence in order ta farce the majority to be free.

Dudley Edwards shows that Pearse lind no iden of what the majority of his lellow countrymen were like. He "wrate, acted and died for a people that did not dispel any doubts that might arise about his canvictions. It was once remarked of mother (but very different bishoma, Lond Kachener, that he was "not a great man, but a great man, lart a great man, l great man, lot a great marryr. But, as Dudley Edwards shows to this alsoridag and perceptive biography, that is precisely what Pearse wanted



Shive Naturaje, the Lord of the Dance ond the patron of temple dance-balls in Judia. From Iconography of Religious—an Introduction, by Albert C. Moore, published by SCM Press at £12.50.

Royal authority

I-rance in Crisis 1620-75 selected, translated and introduced by P. J. Corency Mscmillan, £10.00 sud £4.95 ISBN 0 333 10471 9 and 21218 5

Roland Monsuler, who proved that the barney was not of mutual respect.

Roland Monsuler, who proved that the barney was not of mutual respect.

Roland Monsuler, who proved that the barney was not of mutual respect.

Covency could well have distinguished instead between great princes in the Covency could well have distinguished instead between great princes in the Covency could well have princed in the Covency could well have a listed between great covency could well have princed in the Covency could well have and the Covency could well have a listed between great covency could well have a listed between great covency could well have and the Covency could well have coveney had between great covency of the two perpetually sought permanent influence in the councils of the kiog, and the cases no mobile of both robe and against specific threats to their princes like Conde, who perpetually sought permanent influence on the king of the kiog and the cases no mobile of the kiog, and the councils of the kiog, and the cases no mobile of the kiog, and the councils of the kiog, and the cases no mobile of the kiog out the councils of the kiog out the councils of the kiog, and the cases no mobile of the kiog out the councils of the kiog out the councils

The total science of man

Foundations in Socialinguistics: An alongside comparative politics occurrency have been relabelled as significant fact about lenguage. Still, donc, will preside over by Delt Hymes.

Taying Ethnographic Approach to be ranked referencing has been done, and the and function is probably the must alongside comparative politics occurrency have been relabelled as significant fact about lenguage. Still, donc, will preside over by Delt Hymes. It is not only the sheet scope of his voluntary liquidation.

Taying Ethnographic Approach along the confidence of the confidence of

Jonathan Culls

becomes any particles of the properties of the p

Profits before patriotism

other man with the draum of Easter Week.

The poetry of politics

spective is certainly true to the same of the ort, in necessary step is an associated of the ort, in necessary step is an associated of the ort, in necessary step is an associated in the ort, in necessary step is an associated in the impossibility of sensation the impossibility of sensation the impossibility of sensation of the impossibility of the impossibil

The gearing of the entire economy to the war elimin which proved in excapable bad therefore to be impravized under conditions of all-caned scoretly. But, as Hardach emphasizes, in a nurker-porented economy the tendency towards business as assual proved to be very strong. The scramble for profits survey of the economic strong and business interests looked business are appropriately for the economic bits are appropriated to prior and business interests looked business as assual proved to be very strong. The scramble for profits is lardly more than ullusive. He was interests looked business interests looked business interests looked to be supposed to the experience of the first world war. The backed for profits and business interests looked business interests looked the huitefront to post-war and business interests looked the huitefront to post-war and business interests looked the huitefront of post-war and business interests looked to be supposed to the very supposed to the experience of the first to the curtalineous of supersonsion of this point is larged in experience of the first to the curtalineous of supersonsion of the first to the curtalineous of supersonsion of this point is larged in law and looked the huitefront of the huitefront of the interest of the war very supposed to the curtalineous of the second. Hardach includes a chapter of the looked the huitefront of the looked the huitefront of the second. Hardach includes a chapter of the war very of the very of the very very of the looked the huitefront of the market mechanism in the labour screening the formation of the first of the war verys. This was of the la

Hoth Covency and Deysn make h Hoth Coveney and Deysn make he clear that the superputar and same-times misjudged attempts of Richelica and Augurin to extend royal power at the expense of tracktional privileges were succeeded, nut by the triumph of Louis XIV ever thuse restroicts, but by a realization, was the only way of proceeding. The intendent, for axample, was slawly changed by the two cardinols frum an inspector into an executive official, but during the personal rule he resumed his iess contraversiel rols of inspector once

A perceptive and stimulating new essay by Dr Caveney introduces this latest addition to recent collections in English of articles and extracts from hacks on sevemeenticentary France. Both the "general erisis" and the "French erisis" of the seventeeath century are aliminable tapics far undergraduates, and this volume not only mokes avoilable snots relatively laccessible materiol, but also debote to the regrettably increasing number of students whose shavilelge of French is indequates.

The back includes two lengthy sections of the argument by Boris Forshney that the revolts in the years before 1648 were spontaneous populer movements against a feudal popular movements of the services of the former news accepted the distinction between the old mobility. Their follows the coleration of fire and popular movements against a feudal popular movements against a feudal popular movements against a feudal popular movement against the extremelous popular movements of the first three some same of the first three some sharp difference of it is the one popular where Csveney's against the catheologic popular movements of the first three some sharp difference of it is the one popular where Csveney's against a feudal popular movement of the first three seveney against a feudal popular movement of the first th

BOOKS

Semidiknon unsulites and demonon mut than hely so rices the difference and mention of the triplination of the complete and mention of the triplination of the complete and the c Quielles une mossilites que seinquoi unit thunge I bule. to objet I mais feen son of Jen at the self of soone the fonth A hone is enses the book of the tales of Car implants and carried the Chances of estos could the mile. Re mines Citi ann parte ac

A large, bold and elem hand is characteristic of the Ellesmere MS of Chuncer's Camerbury Tales; it is one of the earliest and must authoritative of the extant MSS, stated 1-100-10. Well-preserved and clubarately decrinted, it is thought to have been campiled in the found area on the evidence of dialect and orthography. The lower partion of f. 236v ls reprinted here ond concludes the poem thus; "Here is ended the bank of the tales of Canterbury rampiled by Geffrey Chancer of whos sould these crist hane marcy Amen." From English Literary Hands from Chancer to Drydge by A. G. R. Pettl, published by Edward Arnold at E14.50.

•

Waging holy war

What Were the Crusades? by Jonathan Riley-Smith Macmillan, £4.95 and £1.95 ISBN 0 333 21372 6 and 21373 4

A generation ago the title of this useful little book would have been dismissed as an Insult. Everyone knew what the crusades were. We lisped in numbers : o first crusade in 1095, a seventh crusade (some said ninth; in 1270, and an oftermadi, vagne, amorphous, messy, diar sometian extended from Cyprus in Malra in the Tentonic Knights, to the Knights of St John and nor ambulance services on the mie tack, and to Vienna and the "sick man of Eurape" and Kemal Ataturk on the other. But the crusades, tom court, no question: from the capturo of Jerusalem in 1100 to the

loss of Acre in 1291.

As we grew more souldsticated we realized that the numbers were numbers of convenience, that the crusading movement was emlentic, that the survival of the kingdom and principalities in the Holy Land depended on constant recruitment and conscant financial and mercantile support. The more literate among us grew auxious about Chaucer whase knight had " reysed in Lectow and Ruce", to say noth-

structure was further sanctified by one of the few great narrative histories of this century when his Steven Runcimum produced his splendid trillogy un the crusudes.

How far has the pattern changed? What were the crusades? How the south of France, ogainst pages deep do wo look lum their in the Baltic, against by powers, structure to achieve a reasonable even against private enemies. decision? Mr Riley-Smith of Queens' Callege, Cambridge, one of the most experienced of the younger posing a question (what were the school of crusading historians, with substantial work on the crusades?), two themes—z jost cause and legitimate outhority and substantial work on the crusades, the military orders, and the Lutin the military orders, and the Lutin erusaders? and when were the cast already to his credit, achieves sades?). Riley-Smith is judden a local and precise answer in the cautions, and assumes a knowledge brief essay. The flow of his hilb-lingraphy indicates the flaw of his argument, work on the papal atti-tude towards war, followed by works argument, work on the papal atti-tude towards war, followed by works on canon low, an the vow, and the distant date of 1095 for the are indulgance, sandwiched between of the movement is correct, and he selective general works and works it stemmed from on initiative the on individual erusades and on the by Urban II. religious orders.

A crusade aceded the authority of the Pope, representing as it were the authority of the legitimate prince in a just war. The solean vow was the symbol of and in a sense the making of a crusaler. The privileges that resolted could make him a sommary orcheintier in the solution of the solut ing of Granada, Algaciras, Morocco, Armenia and Turkey. But our union structure remained invindate, strengthened by aur memories of Gibban, and absorbed into the maintains, hedged round with legal safetium, and absorbed into the maintains, hedged round with legal safetium, and absorbed into the maintains, hedged round with legal safetium, and absorbed into the maintains, hedged round with legal safetium. stream of undergraduate essay and guards, accurded to crossaders and examination work by the clear surely subject to misinterpretation, stream of undergraduate essay and examination work by the clear analysis of Sir Ernest Burker (on analysis of Sir Ernest Burker (on the same of the sa lunger even deemed warthy of men-bourdry in return for his service in tion in the select biblingraphy), the fluly land or its equivalent. The

sionals, who knew just what the the concept of Christendom s and mulergraduates of his day wanted to arbieve a safe beta plus. The knight killed not men but evil

gave facus to the obvement, but Spain was always a potent thesite for the crusader and crusades were further waged against hereics lo

Riley-Smith's division of material is interesting-five short desptera two final questions (who were the

There is no such confort possible for the terminal date. "The lan crusade, in the true sense of the terms, cannot be deed, water the World's Debate "

H. R. Loyn

In outer space

The Structure of the Universe by Josean Northern Press, 54.25 and 51.55 (SIN 0.19 28082.4 and 217653.6 (SIN 0.19 28082.4 and

ranclusions. Untiler certain circumstances the force of gravity may become reversed, for example, and the gravitational constant may slsa decrease steadily with time.

These ore fascinating emcepts and one begins Narlikur's book with high expectations, but, alos, they are not fulfilled. The opening chapters are devoted to a summary of various topics including stellar evolution, he observed structure of our own, and distant galaxies, cosmic vays, and galaxies and quasars. Ton nde galaxies and quasars. Ton most is attempted here in mo small a pace, which loads to unevenness combined with careless slips and apportant anissions. Same of this matrial scens to have been combined when the care was any in the place of the same of the sa

partial scents to hove been compiled about five years ago and it is a leadequate account of the wealth of information gained by the latest information gained by the latest information techniques.

As a theoretician Nurlikur is newally more at home with concepts then with abservations and his surery of cosmological ideas in the second half of the home is better. There is an interesting discussion about the arrow of time "but one but the arrow of time" but one but the reallounde behind the supplemental with fresh insights late the reallounde behind the stayle-Narlikor theory. To be told say that the equations are bused spot the principle of least action, and that "they are much more complicated them Einstein's", is really needer.

In discussing the confirmations.

la discussing the confrontation of observation with theory grave dust are expressed about the cosmological interpretation of quasor while, and Nariikar gives less that a fair account of the present the a fair account of the present-day one case which the present-in the 1960s the large reishift of quagranter and problems which the vast distances which they applied, and tence to seek alterna-

Pi squared

k Brewer lios been elected as t Master of Emmanuel College, hy P. Beckmann Si Marlin's Press, £2.50 Master of Eminanuel College, helian Culler is fellow of Brase-hadian Culler is fellow of Hull, lander of The French Economy

Risks from radiation

Statistics are lovely

a disint as a incase af measuring die weak mognetic fields in intersellation of the mounts ogs he indicated some remarkably some particul of serventians. In the some particul of serventians in the serven

Away with abstraction

Completeness and Bosis Praperties of Sels of Special Functions by J. R. Higgins
Cambridgo University Press, £9.80
ISBN 0 521 21376 2
Integral Equations; A Short Courae

A small part of the geometric superstructure, by L. G. Chambers

A small part of the geometric superstructure, problems but up to now workers in the ground stress of the parts from specialist texts or the grant stress and other expunsion integral equations, treated as a rather; isolated topic, The lavel of exposition in in the traditions of a methods course for second ar third problems but up to now workers in the grant stress of the parts from specialist texts or the original part of the grant at the section discusses problems which are either had to extract these parts from specialist texts or the section of the theory of concrete account of the theory of lategral equations, treated as a rather; isolated topic, The lavel of exposition in in the traditions of a subject with a very brief or section discusses problems which are concrete account of the theory of concrete account of the theory of lategral equations, treated as a rather; isolated topic, The lavel of exposition in in the traditions of a subject with a very brief problems but up to now workers and other expunsion and the provided topic, The lavel of exposition in the traditions of a subject with a very brief problems which are concrete account of the theory of concrete account of the concre

A Histary of Pi

A Histary of Pi

A Histary of Pi

By P. Beckmann

Si Marlin's Press, £2.50

A Histary of Pi

By P. Beckmann

Si Marlin's Press, £2.50

Both the books under review reflect

A Histary of Pi

By P. Beckmann

Si Marlin's Press, £2.50

Both the books under review reflect

A Histary of Pi

By P. Beckmann

Si Marlin's Press, £2.50

Both the books under review reflect

A Histary of Pi

By P. Beckmann

Si Marlin's Press, £2.50

Both the books under review reflect

A Histary of Pi

By P. Beckmann

Si Marlin's Press, £2.50

Both the books under review reflect

A Histary of Pi

By P. Beckmann

Si Marlin's Press, £2.50

Both the books under review reflect

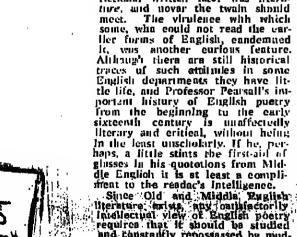
This book provides on the abstract

This book provides on the rudiments portion of the rudiments provides on the feeling that mathematics have not come the abstract of the abstract

This book provides on the rudiments of the abstract of the rudiments of the ecount of the rudiments of the rudiments of the rudiments of the rudiments of the complete and Banach speece and volterra equations are treated by examines the provides of the abstract

Both the books under review reflect.

This book provides on the theory in Hibert and Banach speece and volterra equations are treated by examines the rudiments of the account of the rudiments of the rud



Old English and Middle English

The general attitude to earlier English literature has choused a good deal for the better since 30 years ugo. Until then it was all tao

often assumed that everything written in English before about 1550 was language, and averything fictional written later was litera-

Routledge & Kegnn Paul, £8.75

by Horek Pearsall

ISBN 0 7100 83963

investigation.) The general prossume from the seventeenth in minimal pect of white our helptest and hest students of English which to study was not emirely cheering. As one would expect, of topics mentioned for research, those in the twenlight Guthic literature.)

Our difficulty, and the interesting paint, is that the very concept, in the largest single budy of applications wished to study the Victorian minor writers, and little concept of other thousing of such as plants at might be recognized. A high degree of other thousing of such as policies, and little concept of other thousing of such as policies at the criteria of other degree of the formation of Dickens, none of Thackeray or of many interesting minor writers, and little concept of other thousing of such as policies at the criteria of other degree of the formation of Dickens, none of Thackeray or of many interesting minor writers, and little concept of other thousing of such as supers. Hardly anyone second interested in Victorian poetry. What was remarkable from the point of view as policies at the criteria of other thousing of the English language on the construction. Our difficulty, and the interesting point, is that the very concept. In micheval English, "literature" and illerature was much entered to study mind the largest single bedge of applications with the property of the century with the largest single at the lar remarkable fram the point of view and the present subject is that mora appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the functional modern appliconts weated to study Middle English literature of the poetry. Itself confusingly for literature (and noverlise ments) are retoriced, it always fresh. He never flags, even when tulling through the less whether by leurning, or as folk and modern make literature (and noverlise literature (and noverlise ments) are retoriced, it always reshet that everything, quates ophly, is always fresh. He never flags, even when tulling through the less whether by leurning, or as folk and modern make literature (and noverlise literature (and noverlise

Poetry as the product of a learned tradition

In the least susciolarly. If he porhaps, a filter stints be first-ail of glasses in his quototions from Middle English liters.

Since 'Old and, Middle Registant to the reader's Intelligence.

Since 'Old and, Middle Registant to the reader's Intelligence.

Since 'Old and, Middle Registant to the reader's Intelligence.

Since 'Old and, Middle Registant to the reader's Intelligence.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Since 'Old and, Middle Registant's the beginning of the poets.

Among this week's reviewers Brewer lies bee

Anthony Hewish

research we know so little about how, and where, pulsar radiation is actually generated. Perhops Gruham Smith's admirable review will stinulate fresh young minds into grappling with these problems.

Classified Advertisements Index

Appointments vacant Universities Fellowships & Studentships Polytechnics Technical Colleges Colleges and Institutes of Technology Colleges of Education

Colleges of Further Education

Colleges and Institutes of Higher Education Colleges and Departments of Art Research Posts Administration Overseas Adult Education Librarians General Vacancies

Appointments wanted Other classifications Awards

Announcements **Exhibitions** Official Appointments Personal Courses Holidays and Accommodation

HEAD OF PHARMACY AND SCIENCE

A degree in pharmacy or a rolnled subject.

To lacture in Bio-Chemietry Including disponsing phermecology, physiology, methemetics end ecience et equivelent of City end Guilds Final Technicat level

A degree in pharmacy of a foliated shorter, expensed in membership of Pharmacountient Society, expensed in the shorter of hospital dispensing or teaching.

Solary: £4,599-£5,818 pe.

Benefile: Iros accommodation: eversoes and children's

Allowances and other banelite; boarding school tees; peld terminal leave; two year contract passibly tenewable. 77 CO 105

(SAUDI ARABIA)

COMMUNICATION SKILLS IN ENGLISH

Tills Programme has been developed over the last two years with Brilleh Council prolossional support

and hee involved the production of specialised teaching materials for the implementation of English Medicine. Required for September, 1977:

Maleriels Writer

Maleriels Writer
The Writer will be responsible to the director lot
the ovatell design, construction, end implementation
of the ecedemic progremmee. Dullee will include
course design, edeptetion of existing programmes
ond meteriels, and some femilierisetion leaching
at all levels of the Progremme. Periode of the
confirect will be epent in Britein researching
educational techniques and meteriels.
Candidates, men only, must have a Mestere degree
in Science. They should have a thorough knowledge
and experience (at least five yeers) of existing
ELT metorials with perlicular reference to those
designed for students of science and lechnology.
Selary: £8,794-£13,494 pe secording to qualifications

Selary: £8,794-£13,494 pe eccording to quellications end experience and proportions of time spent in Jeddah and London. There is no local taxation.

cendidates will be raquired to shere); 80 days annuel

Return fares are paid. Local contract is guaranteed with the British Council, Please write briefly stating administrations and length of appropriate experience quoting televent reference number and title of post

for luriher delella end an eppticetion form to Tha British Council (Appointments), 65 Davies Bireet, London W1Y 2AA.

Benefile: Iree furnished accommodation; (single

(GHANA)

PROGRAMME

King Abdul Aziz University, Jeddnir

Universities

OVERSEAS TEACHING POSTS

Oseke University.
MA or PhD in English studies TEFL qualification

MA or PhD in English and highly desireble.
Selery: Y174,000-Y283,000 per month (rete of exchange approx. Yan 469 : £1).
Benetits: Instellation and education grants; Iwo year 77 PU 104

SENIOR LECTURER IN ENGLISH (POLAND)
Department of English, University of Biteels, Scendwick.
Degles and one yeer postgreduate TEFL qualification
or MA in Applied Linguistics and at least one yeer's Selary : Ziotlee 5,400 (Z134.2 equals £1 et prosent talo

of exchange) per month tax free plus Sterling subsidy of £933 pe. Benefite : free furnished accommodation ; medical

echeme; employer's portion of UK superannuallon one yeet contract renewable.

SENIOR LECTURER IN ENGLISH (POLAND) Deperiment of English, Wyzsza Szkola Pedngogiczna

(Pedegogical University) Bydgoszcz. MA in English Lilerature and relevant toaching elery : Zis6,900-7,350 per month (Zie34.2 equals £1 at present rate of exchange) tax free plue storting

aubaidy of £933 pe. Benefits : Iree lurnished eccommodation ; medicel scheme; employar'e portion of UK superannuellor one yeer contract renewable.

LECTURER IN ENGLISH

(POLAND) Depertment of English, University of Gdensk. MA in Theoretical or applied Linguistics or Methodology and et leest two yaera relevent experienco. PhD desirable. Mele candidates

leiery : Zis6,150 (or Zis6,900 if Sanior Lecturer le appointed) per month (Zie34.2 equals £1 et prasent rete of exchange) tax free plus etarling subsidy of Benefits : free furnished eccommodetion ; medical

Capilly City

ASTON IN BIRMINGHAM THE UNIVERSITY MANAGEMENT CENTRE Applications are inclind for a nan-year LECTURESHIP in MARKETING.

Commetteino salary will be line funde £3,353 to

BRADFORD THE UNIVERSELY. CHNIOR LECTURES IN Applications are invited for fin above post in the School of Applications are invited for its above post in the School of Applications in the School of Application in the School of Application in the School of Application in the School of Its and Its and

Applications, preferably from Pharmacles with a 1th D. degrae, are invited for the above position. The aucessful service occident to a component of the concine to a component of the component of t faser
Salary within range \$3.323,
to \$1.495 per annilm Spuns
annihable.
Further particulars/applicas.
Further particulars/appl

BRADFORD

BRUNEL THE UNIVEUBITY THE UNIVERSELY LECTURIOR IN COMPUTED

Applications are levited for industry with a good honours degree and research or instituted experience will be piven to the following area: data-processing area: data-processing area: data-page and applicate and applications with applications of the following area: data-processing area: data-page area and applications are applications are applications are applications. Salar History Scale 63,566— En; 650 Pius 640H London Allowopco, The post is to be itself of some as questing. Application forms and further put itself of the post of TE TREADING

DAISTU BRADFORD CHAIL IN YOUTHER OF THE PROPERTY AND THE MANAFEMENT CENTRO
Applications or mylical infine above not from mot arrival to the control of th Application forms on par-iculars of appointment me evaluate on request promise personnel Office. University of pradiord. Battamend lined fradiord. West Yorkenbre 1977 119. Telephona Bradiord 53466. 881. 203.

UNIVERSITY OF SCIENCE & TECHNOLOGY KUMASI, GHANA

Applications are invited from suitably qualified persons

1. FACULTY OF SOCIAL SCIENCEB
DEPARTMENT OF GENERAL AND AFRICAN STUMES
POSTS: A. Lecturer/Senior Lecturer in Law (with specia interest in Company, Commercial and/or Industrial Lar.

B. Lecturer/Senior Lecturer in Sociology (with special interest in Industrial Sociology or Social Psychology or Medical Sociology and Research Mothods). C. Lecturer in History (will special interest in Polace)

Thought and international Relations).

D. Lecturer in Geography (with epecial Interest in Climbology of Geomorphology and Quantitative Methods).

2. DEVELOPMENT OFFICE Deputy Director of Wurks [Architecture].

C. Archflect. Quantity Strvayor

OUALIFICATIONS:

Candidates should hold the relevant professional qual-SALARY: Lecturer/Quantity Surveyor/Architucl---C5,200 by C200

lo C8,000. Senior Locturer/Sunior Architect-C7.400 by C200 lo C0,000.

Deputy Director of Works-C9,00-I.00. Other burelile include cluldron's attowners, lax free car mointenance efformica, embaldied accommodation, less

modical attribut nut gonerous home leavo. Appliention forms can be obtained from the Director, Acadomic and Student Affairs, thrivously of Science and Technology, Kujunsi, Clinna, or Irout the Senior Assistant Registrar, Universities of Clinna Office, 15 Gorden Square, London WCIII OAG. Completed lerms should be referred ant Infer their Gilt August, 1977.

TRENT UNIVERSITY, ONTARIO DIRECTOR OF ADMINISTRATIVE AND

POLICY STUDIES PROGRAMME

Trent University is creating an interdisciplinary programme leading to the degree of the tetebre of Administrative Sudies. This four-year homours programme at the undergraduate level is intended to provide students with courses of sudy which will prepare them for careers in either the printed public sections. The programme with the administratively and intellectually based within the Facotty of Arts and Science and will draw heavily on appropriate courses presently offered by the University in such disciplines as Economic, Mathematics, Sociology, and Political Studies.

The University is convectable a Director who will work side Advisory Bodies in initiating and developing the programma

Applicants are expected to have strong ocademic creations and the administrative experience necessary to meet this challenge successfully. Rank and salary open. Applicants must be able to salisfy Canadian immigration

At applications will be treated in confidence and their

The Deon of Arts and Science Trent University Peterborough, Ontarto, Canada K93 7D8

THE UNIVERSITY ADMINISTRATIVE OFFICER
(MC/AD/TIT)

Salary on scale Administra-tive Grade 1A 122,904 to 20,627 per senum.

CHAILI INTERPRETATIONS

INITIATURAL STUDIES

Applications are smile be suitable qualified, seems with the future in control of the property of the future in Temporary of the state of the s

Manufillien, combine or further this rang, of activities. For this post special interest and sputtingstones in Restoration and Englithmental Corner I therature tray by an internaling. 26 August, 1977.

University of

Sydney

New South Weles

FACULTY OF

Royal Military College Guniroon, Canbairn

LECTURER:

MECHANICAL

ENGINEERING

DEPARTMENT OF

Although not essential, a specialist knowledge of Thermodynamics would be on advantage. The successful inplicant will be especial to leach in this and in a mannior of other solviers in the undergraduate degree course which leads to Backelor and Harrones degree; in Laghacring, the well also be especial in participate in the continuing development of the continuing development of the Department's laboratories and to pursue an active research programme.

Heelth Commission of

PROFESSOR OF

PROFESSOR OF

PROFESSOR OF

OBSTETRICS AND CYNAECOLOGY

The successful applicant for nach Chair will also be oppointed Chairmon of tipe associated Hospital Departmentor the tipe three year form of the Hospital's operation and will thereafter be eligible for responsiblement. Link Professor, will be provided with recently

The University of Sydney

Now South Wnles

MEDICINE

SURGERY

MILITARY STUDIES

Ouniroon, Canbairn
The University has established
in Faculty of Military Studies
of the Royal Military Studies
of the Royal Military College,
Duniroom, ALT and It
co-operating with the Department
of Defence in the operation and
development within the context
of the Commonwealth
Government's Intention in
condition a separate autonomous
degree-conferring Defence Force
institution. Appointment will be
for the staff of the University,
but on establishment of the
Defence Force institution the
staff of the Paculty will transfer
to its yemploy.

Grilfith University LECTURER: SOCIOLOGY ANTHROPOLOGY School of Humanities

Graffith University, the second University in Brisbane and the University in Brisbane and the third in Queensland, consided its thrist grodunte students in 1975, The School of Humanities odmitted to the University is organised in tour problems organised in tour tourist or sensitive, and the School hopes to appoint to it a secondarist or weith outstrongloods with suitable qualifications in one or more of the following fields—sociology of history with particular reference to aconomy and society; o schology of the medic; occiol-school reference to Australia, but opplications will also be welconsel from menor women with qualifications and sociations and sociations. School of Humanities

Applications are invited for ha following posts, for which applications stone on the dele-hown. SALARIES tunions phown. SALARIES tuniess observite siniod; nre us lollows.—Proleonor SA39,182; Lecturer SA14,436-SA16,884; Sanior Tutor SA12,346-SA14,162; Tutor SA19,185-SA11,883. Further deletts, conditions of appointment for coch post, mathed of application and application, where spitchele, may be ableined from the Association of Commonwealth Universities (Appts), 80 Ordon Equere, London WCIH QPF. University of Melbourne

AUSTRALIA

LECTURER: DEPARTMENT OF HISTORY

Application are invited from industant who have qualifications in the field of Australia History, 15 August, 1977.

University of Ousensland PROFESSOR OF ACCOUNTING

Applications are invited for the store-mentioned Chair within the Department of Commerce, vacont full whigh the resignation of Professor R. S. Gyother. Candidates should take high ocadentic qualifications, appropriate experience, a significant reperience, as significant research record and by canonic

Mecquerie Universily

LECTURER IN CHEMISTRY School of Chemistry

The successful applicant will be especied to teach undergraduate level theoretical and plu deal chandley and will have research interests which lie within the area which lie within the area of the hierarcycles research group which Involves collaboration with the School of Mathematics and Physics and the School of Richardon at Richardon and the School of Richardon and Richardon Sciences (Pharmacul on the soher, 9 September, 1977.

La Trobe University PROFESSOR OF ECONOMICS (FIFTH CHAIR: ECONOMIC THEORY)

Beides research and loaching in commic the sty the appointer all, it is imped, accounts work on instructed problems by prodynadusie nudents. No particular field of lisory is specified; research agicyment rather than field will be the criticalon of appointment. appointment. 22 August, 1977.

TUTOR/SENIOR TUTOR IN HISTORY

is October, 1977.

Flindere University of South Australia LECTURER IN ENGLISH School of Humanities

School of Humanines
The English Diverbiline prevently offers in full reage of standard eligible fluorism double reage of standard fagith fluorism and second year of onceivers and section and section and section portry and fection and makespears. All staff are expected to contribute to one or indicate, insching and research has developed in Abusiness and Advisor, inching and research has developed in Abusiness and Article Literature; indicate the section of the standard section Literature; in the section of the standard Criticism.

Applications will be selection from Pressure who can

responsibility for a most of approximiately 20 brils. The Westnead Hornital is a new 925 bed teaching hornital in advanced stages of development on a 32 hectare site near the city of the teaching hornital in advanced stages of development on a 32 hectare site near the city of the translate in Sydney's repidly expanding western shurbs. The Hornital method sometimes for the most modern degree of the proposition of the Western Matter-polition of the Western Matter-polition fleath Region 11.1 millioni and will descing through index to the established Hornitals and Community Health Services in the region. A major advantaged on the Hospital compassion and the Hospital compassion of the Hospital compassion of the Hospital compassion of the Hospital compassion of the Hospital School for the Family of Health Schools for the Family of Hospital Schools for the Clinical collection of parametrical sudents.

Salary SA35, 182.

PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

Applications are unwhile from sulfably qualified candidate, to full the following chains PROFESSOR OF MATHEMATICS

PROFESSOR OF MATHEMATICS

The main function of the Department of Mathematics is the provision of polanthary and overlong contess in the Faculty of Legincetrop—bacthanical, Goal and Electrical—and Sulvanny, and in the Facultus of Dissinces Administration, Architecture and Burdang, and Italiar Dissinces—Chomical Jacknotogy, Forcetry and Fisherias. Other functions include the development of teaching methods which enable supports in Jerna Mathematics more resultly in what is a cross-cultural situation. The Department of Mathematics cooperates closely in this suspect with the Mathematics Education Control Applicants about have ordensive teaching and boundistration experience in higher education. Special expensions in some branch of mathematics, and a recognition of some of the problems incling local-notogical education in a developing county. This appropriate will be required to stimulate and parameters and development problems of outer tolevence to Perus flew Guines.

PROFESSOR OF MECHANICAL ENGINEERING

PROFESSOR OF MECHANICAL ENGINEERING

Aptilicanta should link no rivinsive toxiciting and autonomitorize arrows and substitution and application and application and application and application of the problems facing technological aducation in a developing country. The appointee will be required to stimulate and pursue research and development programmes of direct relevence to Papua New Guines and to matinal attends that with expinenting employers and the profession. The successful applicants would be expected to fake up their appointments at the commencement in Fabruary of the 1975 occademic yeer. Allowances additional to safety oro payable as follower married K2,300 per annum; slupla K1,300 per annum, in cortain circumstances a child sillowance and additional ferse may be provided for children being sluwance and additional ferse may be provided for children being aducated away from their peronts place of residence. Other bandits include furnished housing (hard goods onlyt supplied at nonlineal review of six months will occur effect of services. Appointment with be on a contract basis apply in investigation of services.

Appointment will be on a contract basis for a maximum of six years in the first instence. The University leasures in apply in make an appointment by invitation of any application of the proposition of the

alego.

Applications in deplicate should include perliculare of oge, noticeally, merital status, termity it eny, qualifications, experience, present post and the name and address of three forearce from whom converted to all applicates. Applications are required by 22 August, 1977, and should be sent to the Repister, The Papus New Guinac. A copy of the application should be sent to the Aspostant New Guinac. A copy of the application should be sent to the Aspostation of Commonwealth Universities (Applet 1, 39 Gordon Squeen, London WC1H gPF, from whom conditions of appointment may be obtained.

UNIVERSITY OF NAIROBI, KENYA

UNIVERSITY OF

CHAIR

IN OPHTHALMIC .

OPTICS .

Applications are invited for this nawly caleblished Chair. The successful applicant will be responsible for the organisation of teaching and research in the subject area of Ophthalmip Opifics and Visual Acience. Further particulars from the Registrar, University of Spackord, Gradford, West Yorkshire, 907 10P. Oldaing date for receipt of applications: 30 Replember, 1877.

UNIVERSITY TALE

PROFESSOR IN DEPARTMENT OF SOCIOLOGY

Applicania must have a Ph O. Sociolopy and several year' University losching and research as periasico somo ol which sussibili developing counities and protection of the prot LECTUREN IN THE SCHOOL OF EDUCATION hi doveloping countries and pictrably within Airica. Applicants must also have averal yoars stininistrative oxportonee in University level. The appointon will be required to provide lendership within his depotiment of Sociology for under-graduals and post-groduals touching and teacurch in the dupartinent. Specialization in one or more of the following aross will be a definite advantage of the country. (2) Mohods of Sociol Scionce Assessich. 13; Fural Godology in an Esat Ahican contost or of eny Altican country. (4) Urban Bocciology and Resional or of eny Altican country. (4) Urban Bocciology and Resional Jaming Idwardoning countries especially in Airicat. [5] Social Action and Community Perficipation and Community Perficipation and Community Perficipation and Community actions. (4) Urban Bocciology and Resional Jaming Idwardoning countries especially in Airicat. [5] Social Action and Community Perficipation and Community Perficipation and Community Perficipation and Countries and Incidential Countries. (5) Social Contest Incidential Countries and Countries and Countries. (5) Social Incidential Countries and Countries. (6) P.O. Soc 30197, Natrobl, Kenye. Applicants recident in UK should else sond 1 copy to Infer-countries of Countries and Countries and Countries and Countries and Countries and Countries and Countries. (6) P.O. Soc 30197, Natrobl, Kenye. Applicants recident in UK should else sond 1 copy to Infer-countries. (6) P.O. Soc 30197, Natrobl, Kenye. Applicants recident in UK should else sond 1 copy to Infer-countries. (6) P.O. Soc 30197, Natrobl, Kenye. Applicants recident in UK should else sond 1 copy to Infer-countries. (6) P.O. Soc 30197, Natrobl, Kenye. Applicants recident in UK should else sond 1 copy to Infer-countries. (6) P.O. Soc 30197, Natrobl, Kenye. Applicants recident in UK should else sond 1 copy to Infer-countries. (6) P.O. Soc 30197, Natrobl, Kenye. Applicants recident in UK should else sond 1 copy to Infer-countries.

Salary scales: Lacturer 1677/
79. J\$9,613-J\$73,917 p.s. Assistion Lecturer 1677/78. J\$7.23UJ\$9,613-J\$73,917 p.s. Assistion Lecturer 1677/78. J\$7.23UJ\$9,412 p.s. (£1 startinp oquals J\$2.16). F.O.S.U. Study and Travel Orani. Unityralisted soconimodelica will be let by the University at 10 per cent of selery, or a housing nilowence of 20 per cont of pensionable selery. Up to the lift pessages tot approximate and on normal terminolion. Detelled applications (three copiest giving full particulars of queliblections and experience, dele of birth, mailet elaute and the names and eddrassos of three referees should be sont as coon as possible to the Register, U.W.I., Mona, Kinggion 7, Jamoica, Further particulars for these posts or a since available from the same source or from the later-University Council, SQ, &t Tollanham Court Noed. London, WtP 607.

UNIVERSITY OF THE

WEST INDIES, JAMAICA

obligations or of invited for obligating posts:

LECTURER/ASSISTANT LEC-

UNIVERSITY OF WESTERN AUSTRALIA Perth

Applications are invited for the following position: LAW LECTURER

in the Law Gehoof
No particular field of interest is
essociated with this position.
The current selecty range for a
Lecturer 1s : \$A14,345-\$A16,084 Leoturen salory range for a Leoturer is: \$A14,345,5A16,084 p.s. Geneille include supersnnuation similar to FSSU. Fersa to Parth for appolates and dependent of the salor salor

UNIVERSITY OF NATAL

EPARTMENT OF GERMAN PIETERMARITZBURG Applications are invited from sultent to the post of

PROFESSOR AND HEAD OF THE DEPARTMENT The estary socie ettached to the

The commencing salary notific will be depended on the qualifications and experience of the auctorestly applicant. In oddition, an annual vection savings bonus is payable, subject to Tressury Leguloi of one.

lotions.

Application forms, further particulars of the poet and information in phriston, medical aid ata? bursary, housing loan and subsidy acheims, long leave conditions and traveling expenses on trat, appointment are obtainable from the Registrat. University of Natal. P.O. Bex 378, Plaintmettz-burg, 8200, with whom supplications, on the practibed forms must be ledged not lates than 5th Geptember, 1977, quoring raterince PMB 32/77.

ASTON IN BERMINDHAM UNIVERSITY OF THE TEVANCE OFFICER

WEST INDIES, TRIBIDAD

LECTURER/ASSISTANT

LECTURER IN THE

DEPARTMENT OF

CHEMICAL

[it Chemical Engineering/8cl-ance of Materials/fuetaling; (2t Chomical Enpineering/Food Tach-nolopy; [3] Unenucel Engineer-inp, is locture in sieze of Chamil cal Engineering Thorogodynomics

rai Enginessino Thornvodynumica and Chemical Kinelica and Read lor Casign [3 year Contract]

Applicante ahould posaese e good incoura degree in Chemical Englishering or en equivelent qualification. A Higher degree, relaying desching applications and germ

The will be expected to leach in the two grans indicated. Balary Scales: Lecturer: 1977/78 TT\$19.071-TT\$29.799 a.g. Assistant Lecturer: 1977/76 TT\$15.400, TT\$18.874 per ennam (£t sterling equals TT\$4.12). F.S. V. Lindunielod naccommodallon if available at the per cent or furnished at 121 per cant or housing nillowance of 20 per cent or furnishment and on normal formination. Study and Travel Giani. Detoiled epplications in the copiest glving luft particulars of quelifications and exportere, date of birth, martial atolax and the normal and addresses of threa 13t referees should be oont as sonn as possible to the Georgiery, University of the Wost Indiges, St. Augualine, Trinided. Odellis of posis aent to all applicants.

UNIVERSITY OF THE

WEST INDIES. TRINIDAD

MECHANICAL ENGINEERING
SENIOR LECTUROR/LECTURER In Production Manogement and/or Manufecturing Processos.

ELECTRICAL ENGINEERING LECTURER/ABSTRITANT LEC-TURER with posigradusis leaching caperinace and in-larest in Power Systems and Mobiless.

A substitution and hydron for the appearation at all leaves of other Hills of the Driver in the Hills of the Driver in the ap-tensis to the Lind of the ap-tensis of the Lind of the ap-tensis of the substitution of the of four within administration of four within administration of the Abendual Court of the conditional of the Leave to all the Abendual Court in the condition of the Leave to other interests responsible to the about the latest and the about the about

BIRMINGHAM THE UNIVERSITY

COMMERCE AND BOCIAL SCIENCE

TEACHING VACANCIES IN THE DEPARTMENTS IN ENGLISHMENT IN AND INSTITUTE IN LITTLE OF THE PROPERTY OF THE PROPERT COVERNALING STIDIES

Tim Faculty of Communication Spekis Strong of Spekis Strong of Spekis Strong of Spekis DEPARTMENT OF ENGLISH Commet period : December

Candidios aboud hold an appropriate operatuals againfication and hard and in the state of the sylabus construction and materials prepared on in the materials prepared on in the initial of Eaglish for English for English for English for English oversons at university or comparable lovel preferobly in the Middle Cast A background in Pablic Administration in Palic Recommics of Planner.

OFFARTMENT OF Carulty of Commerce and Social Sciences

Contract norted: Decreation 1977—Decreation 31, 1779 ACCOUNTED. Sultably nunified candidates diguid have had substan-tial represente of leaching in Accounting and finance in ter-lary admallion, preferably oversees.

OFFICE OF ECONOMICS IN THE SOCIAL SCIENCE AND SOCIAL SCIENCE. AND SOCIAL SCENCE;

AND SO

PETROLEUM ENGINEERING (Oppgrimos) of Chandost (Oppgrimos) of Chandost Engineering): 2 SENIOR LECTURERS / ASSISTANT LECTURERS or post-produced diploma in Potroleum angineering or its aquivalent end prefetably 3 years' experience in the industry or postgraduolo work destrable. At the senior level cogalderable industrial and/or research experience gesentint. Setery Aceles: 1877/78—Sonfor Leolurer: T1925,627-T1935,801 p.a., Leolurer: T1916,077-T1926,799 p.a. Assisted Leclurer: T1916,077-T1926,799 p.a. Assisted Leclurer: T1915,480-T1916,077-P.e. (CI atering equals T194.12). F.O.A.U. Uatumioned accommodulen il ovellopho et 10 par coni or terminated at 72 per cani or housing ellowance of 20 per cani or housing ellowance of 20 per cani or penaloneble salery. Up to five full esonemy pessogae on appointment end on normal lermination, Siudy and Travel Grant. O etailed application saming three (3) referees to Becretary, U.W.I., St. Augustine, Trinided, sa soon as possible. Oetailed poplication of position and position of the annuca, a students of ecoannuca, tectriffer in E. C.
NOM CS Contract period:
10 December, 1977 to il si
December, 1979 to class
Anoutd have a
deared in economics. Special
interest in any seed december.

mica would by watcome. INFITUTE OF LOCAL
GOVERNMENT STUDIES
'LACULTY OF COMMERCE
AND BOCIAL SCIENCE'
CONTROL pariod: 1st October
1977 to 31st Occomber, 1979
LECTURESHIP/LECTURER IN
DEVELOPMENT ACCOUNTING

the fusilists of local Government Studies with associate status in the Dopartners in status in the Dopartners of the status in the Dopartners of the status in the Community of the status of the stat

DURITAM THE UNIVERSITY IN ANTICOLOGY Annigopology
Annigopology
Annigopology
Annigopology
Annigopology
In some sepect of Physical
In Secretary
In sepectation of Secretary
In secretary 

SURREY

THE UNIVERSITY

DEPARTMENT OF HUMAN

OIL BOCIAL DESCRIPTION

A MACARCY POPULATION OF A LUCATORINE BOUNTAINEY OF TOUR THE BOUNTAINEY OF THE BOUNTAINEY OF THE BOUNTAINEY BOUNTAINEY OF THE THE HUMBER THOUGH THE HUMBER THE BOUNTAINEY OF THE BOUNTAINEY OF THE BOUNTAINEY OF THE BOUNTAINEY WILL BE WILLIAM TO THE BOUNTAINEY WILL BE WILL THE BOUNTAINEY WILL BE WILL THE BOUNTAINEY WILL BOUNTAINEY WILL BOUNTAINEY OF THE BOUNTAINEY WILL BOUNTAINEY WIN

nuperantialism inder U.8.5; conditions.
Further particulars of the post may be elected from the Academir thughtar (147); diversity of Surrey, thus of Surrey that of Surrey that Applications, from the month of the culture of the surrey that the surrey of the culture the surrey of the culture that orders of two reference dentity to the culture of the surrey. Other cultures the surrey of the surrey of the surrey of the surrey of the surrey. Other the surrey of surrey, Other the surrey, Other the

THE UNIVERSITY

OFFICIAL ADMINISTRATION

Surrey, Cully

the rais of 13.33.3

DURHAM THE UNIVERSITY OFPARTMENT OF ENGINEERING SCIENCE

The appointment of for three years from 1 October, 1977. O. Entitle stary \$25,918. O. Entitle stary \$25,918. O. Entitle stary \$25,918. O. Hallon Renge 19 Hays suprementation of the photosis for the photosis stary to the theory of the the photosis of the

DURITAM THE UNIVERSITY UNIVERSITY OF PICE

oraditatios wito pre interests of interests in University offinitions strattors. Sinistry on Unude 11 in 125 and to exclusive interests to exclusive interests in the matters of interests of the matter of the interest in the factors of the interest in the

PACTMENT OF PLATFRICAL PACTMENT OF PLATFRICAL PROMETRING SCIENCES Exclinitiani accionessa Applicationi are investo, investo, for the must of lexificial art in many operations at lexification (155.55 per 150.55) in the field of computer system for caprolatination at possible discretification at possible discretification of a possible discretification of the computation of the compu Applications (three copies) citides a curreculare vitae in the parace and addressed live reference, should reach the reference, should reach the reference, the reference (PS 86 / 7182) a Heighton (PS

BAST ANOLIA THE UNIVERBITY TE HOUNTY LECTURESHIP

To the scadenic year 1477/78 coty, in the School us Social Signifies, Applications are invited from those working in any flood of Pelifica but an interest in either Initian and West European, or American o Ed. 190.
Applications (one cory only)
tying full reviculars of soe,
unifications and experience,
egather with the nature und
divesses of three personn to
those reference may be hardhould be an location for Uni-

LONDON THE UNIVERSITY PSYCHIATRY

ADDICTION RESILATION

STATISTICIAN Profession

with ALEC of equivalent to work with the Unit's present examination of the Profession of th

KENYA PNIVERSHY OF NAROBL Applications are invited for the PSOD and ASSOCIATE OUTSOUR IN Heperland of MINLOS APRIMISTIKATION

The atopulations will be exposted to trait in one of the
posted to the training of the
posted to the
p

UNIVERSITY DE NAMOUS

passages : various ellowances.

Coluied epolicitions : 13
copine) intiudini a curricultus
vitie and numing three reference
should be send by straigh and
lefer flown IT Augost, 1977; in
the Robeltine, Recruitment
and Training), tiniversity of
Narods, 19, 10s. Model also
sound one copy of inter-tiniverlity Council, 30, 11 Tottonham Louis Read, Landan Vitlini) Puriture particulars may
be plushed from other outcass.

MANCHESTER/UMIST

THE UNIVERSITY

AND TECHNOLOGY

Applications and invited for a

S.II.C. /S.R.R.C. RESEARCH BTUQUENTSHIP

To oray in the velocularity of the sum in the sum in the sum in the sum of th

NEWCASTLE UPON TYNE

THE UNIVERSITY.

UNIVERSITY LIBRARY

ABSISTANT LIBRARIAN

ABSISTANT. LIBRARIAN
Applications are invited from
the play open the first and the
the Usercraft Library. Applitone should be gradatice with
professional qualifications and
the professional qualifications and
the profession of the profession of
the play of the profession of the
the play of the profession of the
transport of the play of the
transport o

lite social extenses.

Belary, will be at an approprint point on the Oracle 11A
acin 62,333 to 66,600 per
annum according to as a cuit
fications and experience. Alom,
because and experiences, Alom,
because at the appropriate Unit.

- versule appropriate Common actions

Will be required.
Fig there particulars fear he ship he obliged from the Replace.
The University Newmants upon lying NIS. 710 with whom applications (5 copies) together with the immes and subgresses though the copies and purpose the copies with the lampes and subgresses though the copies with the lampes and subgresses and the copies and the copies of three lampes of three lampes and the copies of the copi

Total Control of the Control of the

DEPARTMENT OF THE NOR BAUBICH PRILOWSHIP Relaty within either of the Islander £2,004 to £4,140 or £3,155 to £5,167 for Buseach and Anniogous Staff actording to all index qualifications. Application forms one fur-liner particulars may be ob-pained from the limitary. The furl of the form of the fur-guoing reference number 5.1, pti. Closing data for appli-rations 1) August, 1977.

LEEDS

THE UNIVERSITY

LIVERPOOL THE UNIVERSITY DEPARTMENT OF MORIGANIE, PITYRICAL AND INDUSTRIAL CHEMISTRY

Applications are levited for the 1995 of LECTIVIST IN INCIDENTAL CHEMISTRY. Profession will be given to applicate will interests in one or more of the following cross: 11. Quantitative chemistry, (2) enalytical elemistry, (3) The initial solary will be within the range 23,233 to 23,761 per angular on a scale rising to 25,765 per angular on a scale rising to 25,765 per angular on a scale rising to 25,655 per angular tide names of horse roleros, simuld be received not later than 15th August, 1977, by the linguister. The iniversity, if O, jux 147, three per 14,000 to 15,511X, from whom huttler particulars may be inhabited. Quote leef: 147,866,71188.

> LONDON THE UNIVERSITY

HADEN-PILKINGTON CHAIN DE ENVIRONMENTAL REPUBLICATION UNIVERSITY COLLEGE

LONDON, S.W.7 BURNEL AND TELLINGLOGY INTERPACE SCIENCE

Salary in the scalet \$3,737 to \$3,100 plus Landon Allow-Applications should be sont in a principle of the control of Chemical Comment of Colone on New 2017. Stocking said Angust 51nt, 2017.

LONDON W.8 OTTERN GLIZADETTI COLLEGS (University of London) TEMPORARY LICETUMESIND

Applications ors invited from candidates with a sanda know- independent of invertonals 700 logy and onimal physiology for a foundarry Lectureship in the Consection of The Independent of The Independent of Indiana exactly of the Indiana of Indiana occupied Rainry 23,335—23,465 p.n. depending on examinate pills London allowants of £450 c.e.

NEW ZEALAND UNIVERSITY OF Christchurch APPOINTMENT OF The Council of the University of Cantiversity will present appropriate the Cantiversity of Cantiversity will present a vice-control of Professor N. C. Phillips, who resigned because of the health, and now mylos had the from suitably qualified corsons. The Chancellar of the Uni-recally of N. Matten would be slad in recove, in-confidence, inquiries from any-one whe might be interested in the especialment.

Purities particulars and Con-dilions of Appointment may be obtained from the Secretary (Scansa, Assolstion of Com-monwellis, Universities (Anglas) 24 Oction Source, Landors, MCCRI OPP. Audition Landors, MCCRI OPP. Audition Landors, MCCRI OPP. Audition Landors, MCCRI OPP. Audition 1977.

(1) (1) 2 I

NEW ZEALAND CMINTHIBITA III. OLYGO

CHAIL OF PARRIATINGS Applications close on 50 September, 1977.

Aughications, from woman, in the few culum rites, in annual our addression and addression and university of S ford, Surrey August, 1977. NEW ZEALAND UNIVERSITY OF OTABA SOUTHAMPTON

ODAN, MINUCAL FACULTY The Council of the University of Chipo has under con-nication the appulations of a from of the Modifal Etheol. The Council's Advisory Com-mittee will welcome suggestions of names multiple for considera-tion, or application for the

will be for "no nionitie only being of the ride of 12.32" per entium.

Further preferences may be oblined from Marcell Beatle when the first of the

QUEEN MARY COLLEGE DEPARTMENT OF ECONOMICS Application forms and fur-their pertuints oralishing from the tropisture Union Special Politics, Althe End Houd, Lon-uon 1:1 4MB, to be returned by 17 it August.

SURREY THE UNIVERSITY AUD WILLIAM ON THE STATE OF THE

LECTURER IN DERMAN , Applications are invited from autisty qualified inpile on found of the second of the s Salari will be within the range \$3,333 in \$6,600 per onnum occording to maintenance with amperantous and experience, with amperantous under USB conditions. Conditions.

Turther particulars may be obtained from the Acodenic tipolstare (LEtt. University of Burrey, Ethilited, Euroy (17 ART, or levelupino Hulleford 712/11 ext. 482, Appair of 18 and 18 and

SURREY DEPARTMENT OF LINGUISTIC LECTURER IN FRENCH

Applications are toylind from mildiply qualified, male and mild gradules for the stoyling from the first transfer and from the first transfer and from the first transfer from

AREFFIELD. DEPARTMENT OF

Applications are invited from than and wonten for a LPC-THRESHIP in the above Department, including the Applications of the Control of the Co

LONDON

This is a lamporary appointment for the lamporary appointment for the lamporary appointment for the lamporary in all 1977-711 only, during the lamporary lamporary current of the lamb paycheter with some losseling on other reurses.

Belary scape: \$1.17, is \$6.397 for L.H. for a good honders graduate.

Further particulars and application furms from Um Statting alternative theory 11311. Polytochnic of the South Bank Horobelt fload Landon 611. OAA. Tol. DI #28 8789.

INCHISTIANTS DELIARIMENT ADMINISTIATIVE ASSISTANT Applications are invited to the days part from candidates when research there or an application) professional of mainly Further perficulars from the Rodelfar, Pulyer sly of Esternal, Addition of Esternal, Saliery Ma 4 487, to whom lotters of modification, giving modelle of one, multitations, experience and the hatters and difference of two related slouds be sent by 15 August, 1977, ginning reference A. Dogo-1111.8.

THE UNIVERSULY

WARWICK

Polytechnics

Lecturer Grade II **Senior Lecturer** Furniture Design Industrial Practice Tutor

£3279 - £6968 (Bar) - £8417 plus supplements of £485 - £492 ps Applications are invited for this new post which Applications are invited for this new post which is central to a new SA Hons course in the Design of Furniture and Related Products which will earmence in September 1977. The commencing selsry will be within the Sanlor Lecturer range with a minimum of £5031 plus supplements of £492. Further perilculars and form of af explication obtainable from The Chief Administrative Ditiesr, Tront Polytechnic, Burton Street, Nottingham NG1 48U. A sell-addressed tool-scep envelops will essist with speedy despotch scep envelops will essist with speedy despetch at documents Clasing date 12 August 1977.

oxford polytechnic

Lecturer-Senior Lecturer in Mathematics

(temporary far one year commending September, 1977) (£3,279-£5,493 (ber)—£3,955 (ber)—£6,417 plus supplemente £312 and £180 at less subject to incomes palloy) to teach mathematics on engineering BSc and HND causes. engineering BSC and FIND caurees.

Further particulers end application forms may be abtained from the Head at Depertment of Engineering, Oxlord Polytechnia, Oxlard OX3 088, whom applications, including the nemes of this referess, should be submitted by 16 August, 1977.

SUNDERLAND
THE POLYTECHNIC
FACULTY OF HUMANITHS
Department of Social Sciences
Division of Paychangy
LEGITHHM IT HUMANITHS
EXPERIMENTAL PSYCHOLOGY
Gundlandes should have a
good konoury degree in the social street in the social street in the social street in the social street in social street in social street in some of the following will be an advantage — and formation problems solving will be an advantage — and formation introducing street in some of the following will be an advantage — and formation introducing street in some of the following will be an advantage — and formation introducing street in some of the following will be an advantage — and formation introducing street in some of the following will be an advantage — and formation introducing street in some of the following will be a some of the following will be a some of the following will be some of the ing will be an natatings referentiation problems on properly percentian problems on process of the property of

POLYTECHNIC OF THE PAYCHOLOGY (Her. 88.1)

the state of the s

ULSTER COLLEGE THE NORTHERN IRELAND POLYTECHNIC

PRINCIPAL LECTURER-

Centre for Management Education

MANAGEMENT STUDIES

Applications ere invited from persons who have leught et

undergraduste end pastgreduste dagres isvels and wha heve research experience.

A Monsgement Tescher is required to take part in Sath the college-based end in-plent work at the Management Cantre.

Candideles should preferably be sals to contribute to the teaching al Production Menagement and Organisa-tional/Behavioural Studies, and should be appropriately qualified ecodemically and have hed some industrial

Salery Saelsa: Principel Lecturer: £9,432-£7,134/£8,070

The Polytschnia is a direct grant institution with en independent Board of Governore. It opened in 1971 end now has a student population of some 9,100. It has extensive new purpose built escommadation, including 750, residential pieces on the 114 sore campus overlooking the ses at Jardanatown, a piecesnt and quiet residential area.

There is a scheme of assistance with removel.
Further particulars and application farms which must be returned by August 2, may be obtained by telephoning Whiteabbey (0231) '66131, ext 2243, or by writing to: The Establishment Officer, Uletar Callege, The Northern Ireland Palytochild, Share Road, Newtawnebbey, CB Antifun,

Lecturer II: £3,744-£5,995

Faculty of Technology

PRINCIPAL LECTURER-

Faculty of the Arts

LECTURER 11-

Applications are invited for two posts. Candidates should possess a good keneura degree in Chemical Engineering legelher with several years of appropriate industrial experience. Principal duties will be in degree-level leaching and eurricale development; encouragement and lectities are given for reaction.

(Ref. 8/AO 300A) BUILDING Applicante should be welt qualitied and sxperienced graduales with an eppropriate professional qualification and heve had reaching experience at Degree laval. An interest in applied building research is essential.

the best of the property of th

Feculty of Environmental Studies Ospartment at Arabitecture

Polytechnics continued

Faculty of Engineering

Lecturer II/Senior Lecturer

Oppariment of Chemical Engineering

Lecturer II/Senior Lecturer

in Chemical Engineering

Losturer/Sonior Lacturar required to teach History of Architecture and Planning at 8.5c. Hens. and pool-graduate level by fectures and through studio lutorinis.

Candidates stouid have an appropriate cost-graduate qualification only experience of full-time teaching in a School of Architecture.

Ref. 8/Ao. 3068)

Faculty of Buetnass Deperiment of Business Studies

Research Assistant For project investigating severitising agency performance, IRBL 8/AO.3000)

Faculty of Science Depertment of Chamistry

Associate Lecturer II

in Archaeology Required from 1st September to assist in developing a polaritel new 6.5a, degree course in Archaeological Selencos. Applicants chould have a suitable degree and/at prolasolosis experience. This post will be a lamporary appellment for one yant only.

This post will be a semporery epperman.

* Special Note to: this past only.

Further perfectes and application form tem Science Fertility
Administrative Officer, North East Leuden Polytochnic, Reinford
Road, Strotterd, London E15 4LZ, Tol. 01-534 5865.

(Rot. 8/AO.3000)

Sslery Scales: Lacturer II, \$23,279-25,493 Sentor Lacturer, £5,031-£6,417 (Plus appropriate Government Supplement of up to a maximum of \$403 and appropriate Legitor Allowance)

> Research Asststant, £1,932-£2,094 (Plus Government Supplement of 2444 appropriate Louden Allowance).

All posts, epart from Archaeology: Further details and Application Form from t The Sanior Sintling Officer (2), North East Landae Polysachnic, Percei Road, London 217 436, Talaphone t 91-827 2272 (axl. 20).

> Gioning date : Stat August, 1877 (Pleaso quoie appropriate Reference number)



LIVERPOOL

LIVERPOOL POLYTECHNIQ

CATALOGUER AP2-

A wearney exists for a gentlifted Librarian on CATA-1000UE in the Control Sor-ycos Unit of the Polylechnic Library Beavice.

Duties include classification of subject indexing. The cambons is provided in an interpreted DOM fields formal. Philotograms also indertake risestification units in the various site floweries.

Appartunities exist for work in reader services arous. Applicants altouris to capable collapsing all physical formals.

£2.833, plus £313.

Application forms and fire the restrictions are synthetic from the Paragraph of Officer from the Paragraph of the Paragraph o

the appearance of this adver-

MANCHESTER

THE POLYTECHNIC

JAIN CALTON FABILITY OF

AND MATTHEMATICS

OPERATIONAL HEBEARCH

Amikations are mylled for testurohile in Unoralitate lessery from condidates with sulface or national lessery from conditions and sulface or nationales and sulface or allion relevant frautain onelyalest qualifica-

Por Plether particulars and spolicolous form, (relumble by a summary 1977) riesses some sureful a district and spolicolous formalists. In the summary of the

THE POLYTICHNIC

DEPARTMENT OF FCANOMICS

PART-TIME LECTURER IN Aprilearians are invited from graduates to lench Francounter mainly to Huther National Cor-Lifican Students for up to 12 learn per wook from 19 Sep-tomber, 1977. Rain of ony is 25.14 nor Application forms from flord of Department of Connection and Sacial Signero, Bristo Polytachnic, Coldwirthur Land 1914 of 1914

HATFIELD THE HATTIELD POLYTECHNIC LECTURER & ON SENIOR noth a higher decree and Starting shiery will be rela-

Application forms and further details may be obtained from the Staffing Officer, The lighted Polylechine, PO. Sox. 109 (buffed), Herts, or tog-phone Hetfield 69100 extension Illosing, date t August 6, Ploase quote reference num-

For Sale

SUSSEX Substitution of the control of the c

The Gureau is an independent organisation with a stell of 86 and wide experience in interdisciplinary dudies of the neede of children in the lentily, echeel and socialy.

Some of its major research artivities have contrad on the National Child Sevelopmont Study and we are now planning an extension of this Study into sorty edut file.

A Golfor Recearch Officer is required to lead a feasibility study limb the methods and comion of this extension, assisted by a research officer and the Surasula support staff.

Suitable candidates will have a relayant degree and appreciable research expertise, plus familiarity with feature facing young adults. A knowledge of neoclap policy and practice will be a particular survey, write woll and handle sistatics are important.

Salary is on the social \$5,163-27,194, with good terms of service Oleans dats for applications in the Application form and further Particulars available from Peter Dowdell, National Children's Bureau, 8 Welley, Strast Lenden Ecity.

BAST ANGLIA

SENIOR DESIGNICH L required in the Climatic Research Unit for two years norm let October 1977, to investigate the letter of the year from let October 1977, to investigate the inject of climatic fluctuations on super best yelds in literope The succession of the super letter of the letter

HERTFORDSHIRE The Steering Constilled for a two year (flythings) and and-acted theoryth Project on paid squadlong leave posts of applications for

, SENIOR RESEARCH (\$50001418 (\$534011 & £5.856) RESEARCH ASSISTANT (£2,004 to £4,190) The appointment will be pour not safer, than January, 1978, into will performible be beed at addition Polylach, sit. Becondment arrangement is considered.

runker particulars from Considered.

Funker particulars from Co.
Medior, Stoofing Compilies
Storelars, Middlenex Polysiechnic, Copol House, Britsplacer, Lang Weilhard, Cross, BritsLanguage, Constanting Cons

SHEFFIELD CITY POLYTECHNIC

Department of Mechanical and Pladuction Engineering

PRINCIPAL L'ECTURER IN PRODUCTION TECHNOLOGY Applicants should hold a higher degree or have appropriate industrial espailonce.

Solary Soule: £6,432-87,134 [bar]—£0,670.

Closing date: August 5th, 1877.

Department of Mechanical and Praduction Engineering

ORC CABE BYUDENTSHIP Applications are invited for a Rosentoli Studentidip to work on the project "Messurement of Continuous Saund Levels". The successful annalisate will be expected to seek registration for the degree of I.Phil/Ph.O. Applicants chould have a good honours degree in Engineering with an interest in ejectronice or physics.

Closing date: August 5th, 1977.

Department of Professional Studies

RESEARCH ASSISTANT Required for a fwe-year project involving the design of instruments to assaue the levels of functional reading of pupils in their leaf year in the according action. The successful applicant, who will have the opportunity to register for a CNAA research degree will probably have a first degree or equivolent qualification and be a sustified leacher.

Shirty Reacher: 22,851-23,839.

Closing date: August 8th. 1977.

Department of Biological Sciences Application, is invited for the post of

LECTURER II IN BIOLOGICAL SCIENCES

The successful cendidate will be required to teach a range of the biological coloness at various layer in courses ollered by the biological coloness at various layer in course ollered by the department, perticularly in BIOCHEMISTRY, and to contribute to the future development of courses in the biological sciences. Research expected, apparent is expected. Selvy Godio: 23,744-25,985, Closing date: August 5th, 1877.

Department of Electrical & Electronic Engineering RESEARCH IN CONTROL ENGINEERING

RESEARCH IN CONTROL ENGINEERING
Dynamic Chip Pocilioning Control Systems and Keimen Piltering.
A Research Assistant is required to join a learn working on the design of the control system for a dynamically positionally viscol. The project is supposed by the Science Research Council and is in collaboration with GEC Electrical Projects Ltd., Rugby, Title is a multivariable central and filtering problem which will involve Kalmen likering, electrical and filtering problem which will like the support of the control interval and soluting regulators.
A suitable controlled will have a good degree in engineering or mathematics. The appointment is for a period of fined years.
Solicy Cooles; 22,851-23,039.
Closing date: August 10fts, 1877.

Depertment of Electrical & Electronic Engineering RESEARCH IN CONTROL ENGINEERING

Development of the theory of Apilonal Control Systems and Respillaction in the steel industry.

A Research Assistant is required to join a team working on the development of multivariable control theory, and its expitability in industries systems. The project is in close collaboration with Swindow Laboratorios of like Steel Corporation and will involve an extension of existing work on the decign of optimal multivariable control systems.

Actions of extensive values of the position of statements and the solution of the second degree of required in ongineering or realismalice and the condidate will be expected to sock registration for a higher degree. The experiment is for a period of two years with the possibility. A good ondides will be expected to the period on delay sold : 22,861-23,639, closing dele: August 19th, 1877.
Closing dele: August 19th, 1877.
Willo for application forms and further delett to the Patennial Officer, Shaffleld City Polytechnic, Hallorda House, Fitzalan Square, Shaffleld 61 288.
Please quote Ref. THES.

MEDICAL COLLEGE (University of London)

BONE AND LAINT DESCARCH

RESEARCH ASSISTANT

Research Posts

National Children's Bureau Senior Research Officer

Applications are invited of post of Research Assistants with a substitutification to desist in arch on human protein there are protein the protein the protein arch of the protein the pro

O1-247 5404 Extension 420 Initial salary will be wished the many \$2.004 to \$2.70 plus 8460 London Altowards and superpopulation (1.1.8.8.17) index the plus \$1.00 plu

Colleges of Higher Education

DE LA SALLE COLLEGE OF HIGHER EDUCATION HOPWOOD HALL, MIDDLETON, MANCHESTER A Lecturer in Geography

Applications are invited from quelified persons to help in the teaching of Modern Ansiythal Techniques in Geography in all levels leading to the award of B.Ed. (Hone.). B.A. and B.So. The allocassful applicant will preferably have complete or be prepering to complete a higher degree. Preference will be given to those who can speciallies in Western Europe and/or Economic Geography. The appointment is for September, 1977, or as soon, as possibility of terms may be obtained from the Principal. Application forms may be obtained from the Principal. De La Selfe College of Higher Education. Hopwood Hall. Middleton, Menchester M24 3XH. Completed applications must be required by August 5th. 1977.

E

General Vacancies continued

Colleges of Higher Education continued

County Council

Applications are unvited from suitably qualified persons for the following post in the Authority's Service. WEST GLAMORGAN INSTITUTE OF HIGHER

Lecturer II/Senior Lecturer in Accountancy

To leach Costing, Financial Accomming and Management Accounting up to line standard of all professional courses. Candidates should have good practical experience, and should be qualified members of one of the major professional bodies. Previous teaching experience is desirable. | Post reference

Application forms and further particulars are eveil-eble from the undereigned on receipt of a stamped eddiesaed loolacep elivelope quoting the post

CLOSING DATE. The closing delo for the receipt of completed application forms is FRIDAY, 5th AUGUST, 1977.

John Beele, Director of Education, Education Department, Princess House, Princess Way.

HERREFORD AND STORESTER FOUNTY COUNCIL WORLSHITE FELLICH OF HIGHLE HOUGATON Henwick Ginva, Worrster 1982 6A3

os pussible.

Camildates should have substantial qualifications in falucation Blutles together with teaching expresses. The surface will be required in conflicted in contraction of the property of the prope

Henrylet: Ginve, Avoidment Applications are invited for an application of as LECTPILLA in Stituturally in connected dulies on thi Stylender, 1977, at as soon as possible divin-ation. after.

1 Middates should be gradfraces in sociology with a
higher degree in the sactal
alteration that the sactal
catalidate will be required by

HEREFORD AND

COUNTY COPNEIL

WORKESTER COLLETE OF TRAINING LIBERATION

contribute to the learning of courses in the long within the state of the line Individual say holyiny.

The salary will be according to the larendam Scale for locality in the larendam Scale for locality in the larendam of the larendam of

BRADFORD

THE UNIVEUSITY

PROJECT PLANNING

CENTIC HESEARCH FELLOW

Applications are invited from sulfainty quelified posteroducio candidates la ciudy line comparativa remnantes il ciudy line comparativa remnantes il develue comparativa remnantes il develue comparativa. The study is in callaboration with the Transport and Houd Hestarch Laboratury. Department of the Environment. Although the application of the form one year in the develue of the properties of the study of the remnantes of the topic distribution of the remnantes of the comparation of the remnantes of the remnan

LONDON

THE UNIVERSETY

Fellowships and Studentships

SUSSEX THE UNIVERSITY

OPERATIONAL RESEARCH

GIVOENTSHIP

A STUCENTSHIP Is as shie from Clober, 1977. A research loading to to D.Phi. dourse in the area of physics of example a galletie. The work, thick will be undertaken us to in larger research promining the physical in the first line problems in it remains a depletion, will on the first line section that the first line section the problems in the first line section the model in a line line is the first line section and in a line line will analysis.

LEEDS THE UNIVERSITY DEPARTMENT OF COLOUR

Applications are invited for an industrially sponsural revenues indeptifully sponsural revenues industrially sponsural revenues industrially sponsural revenues industrial revenillar of water solutions of the state of conditions of the state of conditions of the state of the sta

and CASE STRUINTSHIP IN RECTIONICS Applications are for lied for and SRC CASE Herearch Suidenship arranged in col-uboration with Pullips Research Laboratories. The aim of the project is to make and evaluate and evaluate a newestration of movement with a salelitie of our line in salelities. Applicants nights passes a great honours degree in either factivates or Figures and should have a etrano ingress in Physical Biochronian and powers.

Overseas

UNESCO INSTITUTE FOR **EDUCATION-HAMBURG** RESEARCH SPECIALIST

the state of the s

operative reaearch programme on "School Level Education in the Perspective of Lifelong Learning " coordinated by the UIE.

Qualifications: higher degree in education or related fields with professional experience in curriculum development; extensive exporience in theoretical and/or empirical research work; ilueni English, knowledge of German or French

Appointment initially for two years, renewable.

Salary: DM 5,000-DM 6,000 per month, dopending upon professional experience. Additional allowancos; removal expenses; home leave every Iwo years. Successful applicant expected to take up the appointment by January 1, 1978, et Illo lalesi.

Detailed curriculum vitae including educational qualificationa, previous professional positions, lial of publications and nemes and eddresses of Ihree reierees to be sent by Auguai 31 to the Director, Unesco Institute for Education, Feldbrunnensirasse 70, 2000 Hamburg 13, Federal Republic of Germeny.

AUSTRALIA

ROYAL MELBOURNE INSTITUTE OF TECHNOLOGY PRINCIPAL LECTURER DEPARTMENT OF APPLIED PHYSICS

This position is one of two Principal Locuster positions in an Applied Physics Capariment of thirty-live ecodemic staif, with twenty support staff that is dedicated to toeching, industrial investigations and applied research in the stars of Acoustics, Materials, Optics, Rediction and

Applicants should have some manegariol exper lence, substantial teaching experience, a proven record of industrial investigations or applied research, preferably a higher degree and expertise In one of the above creas of the department

The appointee will be involved in the tielsing with local industry on investigational work and essisting the Heed of Department in the administration of

Salary \$23,542 per ennum Ret. No.121/28/AZ. Closing date 16/9/77

Intending applicants for the above position should obtain a Schedule of Duties from the Staff Aranch, Level 8, Suliding 15, 124 La Trobe Street, Melbourne, Tejephone: (03) 346 2822 ext. 2488. Applications should be addressed to the Registrer, R.M.I.T., 80x 2478V, GPO, Melbourne 3001.

PERTH, WESTERN AUSTRALIA

VACANCIES IN TEACHER EDUCATION

Applications closing on Mondey, August 8, 1977, ere invited for the Jollowing positions, which may become vecent in 1978 of the Western Austrelien Secondary Teachers' College. Some appointments may be evallable on a two-year contract basis.

Appointees will undertake leaching responsibilities with secondary teachers in Irelning in the following eress:—Business Education, Communications, Methemetics, Physical Education, Health and Recreation, Science.

BALARY RANGE: Lecturer, £8,807 to £11,330 Senior Tutor, £7,408 to £8,497 Tutor, £6,096 to £7,190

QUALIFICATIONS: A higher degree in en appropriate lield together with teaching experience at secondary or terillery level is generally required. Application forms, detailed statements, ragarding dulies and qualifications for individual positions, and conditions

ol service, mny ba oblained from : Migration Lieison Oilicer Western Austrella House 11S Strand, London WC2R 0AJ

* *******************

Melbourne State College A Constituent Callege of the State College of

HEAD OF DEPARTMENT **MATHEMATICS**

The Mathematics Department is responsible for mathematics subjects to courses for the preparation of printing less hers or teachers d Mallognatics in secondary schools.

HEAD OF DEPARTMENT

LANGUAGE AND LITERATURE

The subjects laught by the Language and The preparation of primary leachers or leachers of English in secondary schools. The Department .. atso responsible for leaching a small number students whose interest is in the literature language and culture of France and for the leaching of modern Greek in a post-gradual diologica course in inter-ethnic stridies.

2 September 1977 DEOSING DATE: Further information about the College and the position, including method of application maybe

The Stall Ollicor, Molbourne Stale Collage, 757 Swanston St., Caulton, Vic., 3053, Australia.

the second secon

General Vacancies

DIOCESE OF SOUTHWARK DIRECTOR OF TRAINING

i procurement and complete for the more port of Original Surface of Franting. The appropriation of mainting the appropriation of mainting and the Section of procure appropriate the value of the Section of the Complete of the American Appropriate the surface of the mainting and restant a result of the distriction of the surface of the mainting and restant a result of the surface of the mainting and restant a result of the surface of the mainting and the surface of the

Salary [post-to-order] of the root is appropriate to technology Cost with honology Cost with the large to the control of the root in the cost of the c

AMGUEDOFA GENEOLAETHOL CYMRU NATIONAL MUSEUM OF WALES

KEEPER OF ART

Applications are invited for the Knoperator of the Coparason & which is vacual owing in the Knepetetin of the Department which is vacual owing in the doubt of the bale Keeter, to be Clinica Contributory paneton could under FSSU, or the factor of the property of the pro Pension Scheine Salary acate 17,500 per autum la 12,12 pt 180 (F.S.B.U.) or 17,500 per autum la 12,12 pt 180 (F.S.B.U.) or 17,500 per arraine to 19,275 per arraine 180 Scheines | 11-les cost of level 5-pt pleanets

Further politiculars may be obtained from the Secretar NVS [Auseum of Wales, Caralli, CT] of the 15 mbs n application is specified that the Victionality, 24 August 1975.

ROYAL INSTITUTE OF CHEMISTRY Applications are matter for the post of 1.5.

QUALIFICATIONS OFFICE

to The Royal incition of Grendeny. An enquantment is Cardeness soon as possible and it is expected that the crisis and on 31 that is the present that a Usperiment as he seed on 31 that is the true of the tension of the presents of the department of the problem of the tension of the problem Applications morked "Contidential" to The Personal Ottos of June 12 Ju

RESIDENT MATRON HOUSEKEEPER

required for a interest that of Desiring on 231 students in the latter of 231 students of 231 state of 231 sta

Classifica Advertisent Juha Ladintok (1817) Juha Ladintok (1817) THE TIMES Higher Education Suipleadent Programme Programme Nove 545 Programme Progr

Instructor (English Language) Oil Industry-Middle East

A major international oil company seeks a Graduate Teacher for service with an associate company to the Middle East.

The accessful applicant will be responsible for:

teaching English to the associate company trainers, and other company employees and their wires

assisting with the development of language programmes and teaching

the supervision of the trainers' social/welfare activities.

Camildates, uged preto 15, should be goadnate teachers with soldingual recognised qualifications in teaching English as a foreign language.

They should have had a minimum of five years' post-qualification experience, preferably teaching Arab Nationals, and most be completely funifier with "direct" methods of English Language teaching using madern malig visual aids including a Language Laboratory.

The salary will be within the range £10,000 to £12,000 p.a. (at pressurrates of exchange). Additional benefits include salary presently free of local tax, annual gratisty, subsidised air-conditioned accommodation, kit allowance, etc.

Please write with full details. These will be forwarded direct to our client, hist separately may companies to exhaus your application should not be sent. Ref. GR1, 1566.

CONFIDENTIAL 17 STRATTON STREET LONGON WIX 8DB

A member of MSL Group International

Official Appointments

NOON BOROUGH OF ENFIELD

EDUCATION

£7,201-£7,879 Plus E468 Car Allowance

plicatione are invited from cendideles with a good are, tasching end substential administrative experies to be responsible for further education in the authorogen legits. Middlesex Polytechnic.

Minduding the Middlesex Polytechnic.

Thorigage facility (temporarily suspanded subject to funder the second systems). 100 per cent removel expenses, genering secommodation up to 2 years. 210 per week lodging secommodation up to 2 years. 210 per week lodging funds? Particulars and application cases.

Tether particulars and application forms evallable from the Chile Executive and Town Clerk, P.O. Box 50, Clyic 1815, Ext. 2502), to be returned by 11th August, 1977.

The state of the s

has recently been formed to reap pay nid propent incribers of he University informed on current revide in all sagers of University es distinct from College, ectivities and develop-nients.

Apply to the Serretty 4 Parsess Court. Combridge, 1-62 50F.

Administration

To advertise in

the THES phone

John Ladbrook

01-837 1234

THE TIMES

Higher

Education

SUPPLEMENT.

New Printing House Squarc

P.O. Box 7, Gray's Ion Rd., Londoo WCIX SEZ

Market and State of State of State

LEEDS THE UNIVERSITY OFFICE OF THE BURBAR

Does a problem challenge you to solve it?

If you've always an joyed flexing your mental nuscles, become an Inspector of Taxes.

Your job? To determine the tax Hability of individuals and of companies large and small. Your sinff up to 50 strong) handle all cases in accountancy and law you will receive with us; because of your personality which enables you to negotiate with a tax payer's the link of manalysing a complex straight and - above all - because you have reasonable independent, our professional manalysing a complex straight und making a fair and purpose of the professional control of the control of the professional control of the control of the professional control of the control of the professional control of the professional

rensoundle internet to compare the control of the tax affairs of an entire of internet payon career you could take charge of the tax affairs of an entire of iteriot on joying wide powers of discretion. You may also spond periods on more specialised expects of taxation end acquire an onviable professional expertise. In itself a valueble career ease to qualifications: Under 32. A Degree with honours—at least second class homours ebility is looked for. Final Year Students may emply.

Starting salary \$2,840-\$4,200 according to experience. If you start at 21, your salary should be earning over \$3,700 at 23, over \$3,100 at 23. By your late 30's you should be earning over \$3,500. By 40 you could be clivil service to o'ln goueral management in the clivil service are voonbeled all over the country. Salaries higher in London.

To find out more, and for an invitation to visit a Tax inspector, write to: Civil Service Commission, Alencon Link, Basingstoke, Hants RO21 1J13, Picese quote A/320/G/ 6

nt a produkte ur inidori qualifization, with protocol experience in staff administra-lion. The post is nysitable imme-

Salary on the IA scale for Administrative Staff; \$2,904 to \$5,637 according to go qualifications and experience. l'urther particulors mny be abtained from the Registrar, for University, Lebde 13, (17, quelling reference num-ber 117;H/BO. Closing tale for oppications 8 August,

Announcements

THE CAMBRIDGE SOCIETY

J. R. Nelson examines proposals for coordinated in-service training

Doubts and dangers in 'grand design' approach

There are current proposals in set up a coordinated system of provision of in-service training. These, together with the present Government review of the rule and status of the polytechnics, emphasive the acert in review the heat way in create new accolumnt centres and sets of centres; the need in review the heat way to effect new rules for existing centres, and how heat to manifor their development in further (and higher) education. These proposals are the most prominent of several current and unrelated but comperable initiatives, oil of which suggest that the approach adopted to implement them will be the "grand design" approach whereby a total system is conceived and introduced, probably on a legislative or pre-

A

conceived and introduced, probably on a legislative or present costs.

This "grand design" approach, however, is based on an intested and unproved communication of resources and in the present economic elimate emisideration ought to be given in the experimental pilot scheme approach whereby are equilibrium to tested first on a limited basis before they are equilibrium to be med in assess the organizational framowork proposed to bring about such changes in order to ensure that it is the one which is the most suitable and whether the method of introducing such changes is one which has been designed to allow these changes to be manitored.

The creation of the Regional Management Centres (RMCs) and how the experimental approach could have been applied with results at least as impressive as those in fact achieved, and probably, with much greater goodwill and enthaisasm.

The Department of Education and Science amounced its intention in 1971 to establish a set of RMCs (12) in England and Wales. They were set up as centres of excellence preforming a coordinating role for the provision of management institutions—half on single institutions and half on the ossociation of two or naure hitherto narelated institutions.

This RMC policy typifies the "grand design" approach:

education within their regions. They were based an existing institutions—half on single institutions and half on the ossociation of two or name hitherto nurelated institutions.

This RMC policy typifies the "grand design" approach: commitment to a national institutional framework; the use original idee; and the lock of an implementation scheme to introduce the idee.

In the event, the policy has mer with mixed success. It was seen as unreal, it lacked the commitment necessary to guarantee its acceptance. Vested interests were not neutralized, nor was their mapasition foreseen. Competitive devolopments were not officially discouraged.

But this RMC policy could have been introduced using the experimental approach. There could have been as initial selection of, say, one regional centre of excellence for unmagement education—one which most adequately met the criteria judged accessary for a successful designation. Those of excellence for management education and the following: a proreal centre of excellence for management education; a clear and indisputed superiority for management education; a clear and indisputed superiority for management education within its poston; e single existing centre (rather than an essociation of centres); a centre in an institution with a no essociation of centres); a centre in an institution with an enosaciation of RMCs in other regions. But the identification of the pre-fequilities for success would have been achieved, and made it nore likely that the other subsequent RMCs would be besed on a tested model, and therefore, the more likely to the successful.

This experimental approach hos, of course, it problems, One is the denger that those invulved in the experiment can sebatage ic. This is a thronger which must be anticipated. Further than the contract of the course of the cour seoning ic. This is a manger which must be anticipated. Further, this experimental approach requires answers to some bride questions: Who generalizes from the experiment to the broadscale implementation? Who has the conscitution authority to draw the correct conclusions? Who determines the timescale of the experiment? Who decides on the success or failure of the experiment?

the timescele of the experiment? Who decides on the success or fallure of the experiment?

These questions presume a planned approach to the creation of new institutions and the designation of new roles for existing ones. There has to be an overview, or masterplen, and en authoritative monitoring of the implementation of the policy. This means that such innovative policies must come from the government which alone has the perspective, authority, and resources needed.

The danger of allowing local initiatives is illustrated by the recent emergence of the lostlines of higher education—an institutional imposession which has assen in a number of spontaneous local forms.

This emergence has all the signs of the classic exploitation of opportunity and local initiative. Nonetheless it distorts the supply/demand mechanism in the merket for edvanced FE because it is not founded on a responsiveness to the pattern of needs in the market, but rather on civic pride and institutional ambition.

The initiative for institutional innovation and change and the responsibility for its implementation must rest with government. But there is a world of difference between the DES possificating over an innovative policy which it then leaves to leaves to hears to implement without paying the slightest regard to realities and the evallability of resources, and the DES occepting responsibility for a sensitively monitored experiment and its subsequent development based on proven success.

Both central government and leave failed to implements.

success.

Both centrel government and leee heve falled to implement successfully innovative ideas for institutional development because they did not base them on proven prototypes. Admittedly this slows the process down. But at least, with the experimental design obecked through, there is the chance for the innovating authority to delegate to local implementers with a proven set of prerequisites.

This is one of the strongest erguments for the experimental approach—with the essential features of success proven, the package cen, as it were, be handed over to l.e.a. representatives who can then be asked to implement the innovative idea in the context of their own specific environments. There is then no straitjacker imposed, but rather a welcome balence achieved between a properly tested design end its broadscele implementation.

The author is loud of the management studies department at Liverpool Polytechnic.



